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EDEXCEL INTERNATIONAL GCSE MATHS: QUESTIONS BY TOPIC

# Fractions, Decimals & Percentages (N2)

## International GCSE Mathematics A (4MA1) · Foundation tier

157 questions · 652 marks · Mark schemes included

Past papers June 2018 - June 2025 · 3 sub-topics


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**HOW TO USE THIS BOOKLET**

Questions are grouped by sub-topic and run from the lowest to the highest mark tariff, then oldest paper first.
Click any row below to jump straight to that sub-topic or question.
On every question page, click ANSWER in the top-right corner to jump to its mark scheme; < QUESTION brings you back.
A gold bar in the left margin marks exactly where the question sits on the original page.
Diagrams, graphs, grids and tables are printed exactly as they appear in the original papers.
Each question is filed under its main topic; longer questions may also test skills from other topics.


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# QUESTIONS

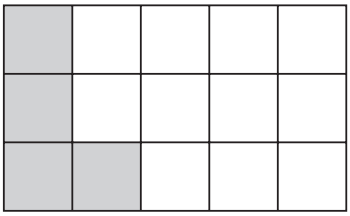
157 questions · 652 marks · 3 sub-topics

SUB-TOPIC N2a

# FRACTIONS

Sub-topic N2a · 65 questions · 248 marks · lowest tariff first

**3** Here is a rectangle **A** made from centimetre squares.



rectangle **A**

(a) What fraction of rectangle **A** is shaded?

.....

**(1)**

Rectangle **B** is made from centimetre squares.



rectangle **B**

(b) Shade 40% of rectangle **B**.

**(1)**

**(Total for Question 3 is 2 marks)**

**12**

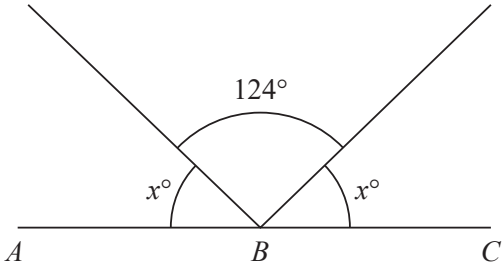



Diagram **NOT** accurately drawn

*ABC* is a straight line.
Work out the value of *x*.

*x* = .....

**(Total for Question 12 is 3 marks)**

**13** Show that $\frac{7}{8} - \frac{1}{6} = \frac{17}{24}$

**(Total for Question 13 is 2 marks)**

**14** (a) Factorise $25f - 10$

.....

**(1)**

(b) Make $y$ the subject of the formula $c = 5y - h$

.....

**(2)**

(c) Solve the inequality $4x + 7 > 2$

.....

**(2)**

**(Total for Question 14 is 5 marks)**

**15** Show that $\frac{2}{5} \div \frac{11}{20} = \frac{8}{11}$

**(Total for Question 15 is 2 marks)**

**11** Show that $\frac{5}{12} + \frac{3}{8} = \frac{19}{24}$

**(Total for Question 11 is 2 marks)**

**12** (a) Expand $4(m + 2)$

.....

**(1)**

(b) Solve $2x + 5 = -19$

$x =$.....

**(2)**

**(Total for Question 12 is 3 marks)**

**15** A bag contains 30 coloured counters.
The table gives the number of counters of each colour.

| **Colour** | **Red** | **Green** | **Yellow** | **Blue** |
|---|---|---|---|---|
| **Number of counters** | 7 | 13 | 4 | 6 |

One of the counters is taken at random from the bag.

(a) Write down the probability that this counter is green.

.....

**(1)**

(b) Write down the probability that this counter is **not** red.

.....

**(2)**

**(Total for Question 15 is 3 marks)**

**16** Show that $\frac{5}{6} - \frac{3}{8} = \frac{11}{24}$

**(Total for Question 16 is 2 marks)**

**14** A small bag of grain contains 2 kg of grain.
A large sack of grain contains 7 kg of grain.

Makenna buys $r$ small bags of grain and $h$ large sacks of grain.

The total amount of grain Makenna buys is $F$ kg.

Write down a formula for $F$ in terms of $r$ and $h$

.....

**(Total for Question 14 is 3 marks)**

**15** Show that $\frac{3}{5} + \frac{2}{7} = \frac{31}{35}$

**(Total for Question 15 is 2 marks)**

**12** Seb went into a restaurant at 18 15
He left the restaurant at 21 40

(a) Work out the time that Seb spent in the restaurant.
Give your answer in hours and minutes.

..... hours ..... minutes
**(2)**

On Friday, the restaurant sold 120 meals.
48 of these meals were vegetarian meals.

(b) What percentage of the meals sold on Friday were vegetarian meals?

.....%
**(2)**

**(Total for Question 12 is 4 marks)**

**13** Show that $\frac{3}{7}+\frac{1}{4}=\frac{19}{28}$

**(Total for Question 13 is 2 marks)**

**20** Show that $3\frac{4}{7} - 1\frac{5}{8} = 1\frac{53}{56}$

**(Total for Question 20 is 3 marks)**

**16** Show that $1\frac{2}{3} + 2\frac{3}{4} = 4\frac{5}{12}$

**(Total for Question 16 is 3 marks)**

**12** Three bags, **A**, **B** and **C**, each contain some marbles.




There is a total of 75 marbles in the three bags.

$\frac{1}{5}$ of the marbles are in bag **A**.

There are 4 more marbles in bag **B** than in bag **C**.

Work out the number of marbles in each bag.

Bag **A** .....

Bag **B** .....

Bag **C** .....

**(Total for Question 12 is 3 marks)**

**13** Potatoes cost 2 dollars per kg.
Carrots cost 3 dollars per kg.

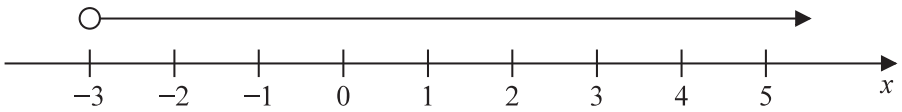
Alfred buys $p$ kg of potatoes and $c$ kg of carrots.
The total cost is $T$ dollars.

Write down a formula for $T$ in terms of $p$ and $c$.

.....

**(Total for Question 13 is 3 marks)**

**17** (a)




Write down the inequality shown on the number line.

.....

**(1)**

(b) Solve the inequality $4y - 13 \leqslant y + 8$

.....

**(2)**

**(Total for Question 17 is 3 marks)**

**18** Show that $5\frac{2}{3} - 2\frac{3}{4} = 2\frac{11}{12}$

**(Total for Question 18 is 3 marks)**

**14** Brendon, Asha and Julie share some money in the ratios 3 : 2 : 6
The **total** amount of money that Asha and Julie receive is $36

Work out the amount of money that Brendon receives.

$.....

**(Total for Question 14 is 3 marks)**

**15** Show that $3\frac{1}{5} \times 2\frac{5}{8} = 8\frac{2}{5}$

**(Total for Question 15 is 3 marks)**

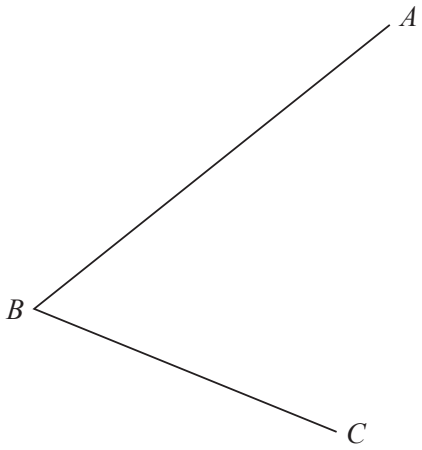
**19** Show that $4\frac{2}{3} + 3\frac{4}{5} = 8\frac{7}{15}$

**(Total for Question 19 is 3 marks)**

**17** Show that $3\frac{3}{4} \times \frac{7}{9} = 2\frac{11}{12}$

**(Total for Question 17 is 3 marks)**

**18** Using ruler and compasses only, construct the bisector of angle $ABC$.
You must show all your construction lines.




**(Total for Question 18 is 2 marks)**

**16** Show that $3\frac{1}{5} \times 1\frac{5}{6} = 5\frac{13}{15}$

**(Total for Question 16 is 3 marks)**

**17** Given that $a < b < c$

the four whole numbers $a$, $a$, $b$ and $c$ have

a mode of 7
a median of 8.5
a mean of 9

Work out the value of $a$, the value of $b$ and the value of $c$.

$a =$ .....

$b =$ .....

$c =$ .....

**(Total for Question 17 is 4 marks)**

**24** The people working for a company work in Team A or in Team B.

number of people in Team A : number of people in Team B = 3 : 4

$\frac{4}{5}$ of Team A work full time.

24% of Team B work full time.

Work out what fraction of the people working for the company work full time.
Give your fraction in its simplest form.

.....

**(Total for Question 24 is 3 marks)**

**TOTAL FOR PAPER IS 100 MARKS**

**10** (a) Write these fractions in order of size.
Start with the smallest fraction.

$$\frac{3}{8} \quad \frac{1}{4} \quad \frac{7}{20} \quad \frac{5}{16}$$

.....

**(2)**

There are only green beads and red beads in a bag.

The ratio of the number of green beads to the number of red beads is 5 : 9

(b) What fraction of the beads in the bag are green beads?

.....

**(1)**

**(Total for Question 10 is 3 marks)**

**16** Show that $2\frac{4}{7} \div 1\frac{1}{8} = 2\frac{2}{7}$

**(Total for Question 16 is 3 marks)**

**17** The bearing of Paris from London is 149°

Work out the bearing of London from Paris.

.....°

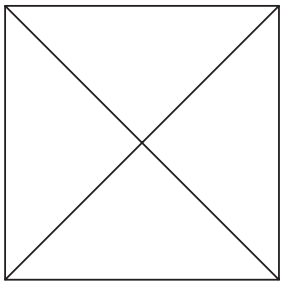
**(Total for Question 17 is 2 marks)**

**Answer ALL TWENTY SIX questions.**

**Write your answers in the spaces provided.**

**You must write down all the stages in your working.**

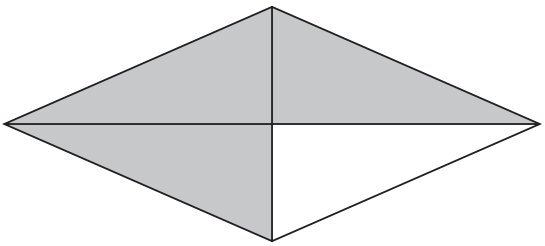
**1** The diagram shows a square and its diagonals.



(a) Shade $\frac{1}{4}$ of the square.

**(1)**

Here is a rhombus.



(b) What fraction of the rhombus is shaded?

.....

**(1)**

(c) Write 0.9 as a fraction.

.....

**(1)**

**(Total for Question 1 is 3 marks)**

**7** $\frac{3}{8}$ of the members of a squash club are children.

$\frac{5}{6}$ of these children are right-handed.

What fraction of the members of the squash club are right-handed children?
Give your answer as a fraction in its simplest form.
Show your working clearly.

.....

**(Total for Question 7 is 3 marks)**

**8** By writing each value correct to one significant figure, work out an estimate for the value of

$$\frac{8.23 \times 181}{0.482}$$

Show your working clearly.

.....

**(Total for Question 8 is 3 marks)**

**17** Show that $6\frac{3}{4} \div 2\frac{4}{7} = 2\frac{5}{8}$

**(Total for Question 17 is 3 marks)**

**22** Show that $2\frac{2}{3} + 3\frac{3}{4} = 6\frac{5}{12}$

**(Total for Question 22 is 3 marks)**

**8** Mairi has 200 flowers.

Of these flowers
37 are white
25 are yellow
42 are pink
The rest of the flowers are red.

Express the number of red flowers as a fraction of the total number of flowers.
Give your fraction in its simplest form.

.....

**(Total for Question 8 is 3 marks)**

**9** 3 cups each contain 200 millilitres of water.
4 jugs each contain $x$ millilitres of water.

Emma pours all the water from the 3 cups and the 4 jugs into a container.
The total amount of water that Emma pours into the container from the 3 cups and 4 jugs is 3.5 litres.

Work out the value of $x$

$x =$ .....

**(Total for Question 9 is 4 marks)**

**19** An aeroplane travelled from New York City to Los Angeles.

The aeroplane travelled a distance of 3980 kilometres in 5 hours 24 minutes.

Work out the average speed of the aeroplane.
Give your answer in kilometres per hour correct to the nearest whole number.

..... kilometres per hour

**(Total for Question 19 is 3 marks)**

**20** Show that $5\frac{1}{3} - 2\frac{6}{7} = 2\frac{10}{21}$

**(Total for Question 20 is 3 marks)**

**16** Show that $3\frac{5}{7} \div 1\frac{5}{8} = 2\frac{2}{7}$

**(Total for Question 16 is 3 marks)**

**17** Change a speed of 90 kilometres per hour to a speed in metres per second.
Show your working clearly.

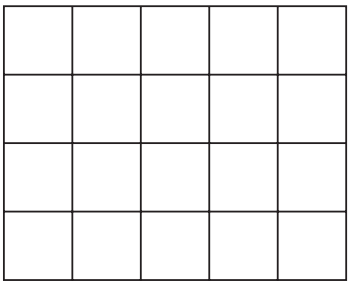
..... m/s

**(Total for Question 17 is 3 marks)**

**15** Show that $4\frac{2}{3} \div 1\frac{5}{6} = 2\frac{6}{11}$

**(Total for Question 15 is 3 marks)**

**4** Here is a shape made of squares.



(a) Shade $\frac{4}{5}$ of the shape.

**(1)**

(b) Write 0.7 as a percentage.

..... %

**(1)**

(c) Write these decimals in order of size.
Start with the smallest decimal.

0.49 0.459 0.4 0.049 0.14

.....

**(1)**

**(Total for Question 4 is 3 marks)**

**8** A hall has 26 rows of seats.
There are 14 seats in each row.

Annie sells tickets for $\frac{3}{4}$ of the seats in the hall for a concert.
She sells each ticket for 15 euros.

Work out the total amount Annie gets from selling tickets.

..... euros

**(Total for Question 8 is 3 marks)**

**17** Show that $4\frac{2}{3} \div 1\frac{1}{5} = 3\frac{8}{9}$

**(Total for Question 17 is 3 marks)**

**22** Show that $3\frac{3}{7} \div 2\frac{2}{3} = 1\frac{2}{7}$

**(Total for Question 22 is 3 marks)**

**23** Hermione buys a boat for \$26 800
The value of the boat depreciates by 8% each year.

Work out the value of the boat at the end of 3 years.
Give your answer correct to the nearest dollar.

\$.....

**(Total for Question 23 is 3 marks)**

**19** Show that $2\frac{1}{3} \div 5\frac{1}{4} = \frac{4}{9}$

**(Total for Question 19 is 3 marks)**

**20** Slavomir invests 5200 euros in a savings account for 4 years.
He gets 2.5% per year compound interest.

Work out how much money Slavomir will have in the savings account at the end of 4 years.
Give your answer correct to the nearest euro.

..... euros

**(Total for Question 20 is 3 marks)**

**6** There are 150 animals on a farm.

Of these animals

19 are sheep
32 are goats
3 are dogs

The rest of the animals are chickens.

Write the number of chickens as a fraction of the total number of animals.
Give your fraction in its simplest form.

.....

**(Total for Question 6 is 3 marks)**

**7** 2 jugs each contain 350 millilitres of milk.
5 bottles each contain $y$ millilitres of milk.

Peter tips all the milk from the 2 jugs and the 5 bottles into a container.
The total amount of milk that Peter tips into the container is 2.8 litres.

Work out the value of $y$

$y =$ .....

**(Total for Question 7 is 4 marks)**

**19** A plane takes 9 hours 36 minutes to fly from New Delhi to Perth.

The plane flies at an average speed of 820 km/h.

Work out the total distance the plane flies.

..... km

**(Total for Question 19 is 3 marks)**

**20** Show that $2\frac{4}{7} \times 3\frac{1}{9} = 8$

**(Total for Question 20 is 3 marks)**

**17** Show that $1\frac{5}{7} \times 2\frac{3}{16} = 3\frac{3}{4}$

**(Total for Question 17 is 3 marks)**

**18** The length of a table is measured as 1.4 metres correct to one decimal place.

(a) Write down the upper bound of the length of the table.

..... metres

(1)

(b) Write down the lower bound of the length of the table.

..... metres

(1)

**(Total for Question 18 is 2 marks)**

**17** The length of a ship is 142.8 m, correct to 1 decimal place.

(i) Write down the lower bound of the length of the ship.

..... m

**(1)**

(ii) Write down the upper bound of the length of the ship.

..... m

**(1)**

**(Total for Question 17 is 2 marks)**

**18** Show that $2\frac{1}{4} \times 1\frac{5}{7} = 3\frac{6}{7}$

**(Total for Question 18 is 3 marks)**

**6** (a) Write $\frac{19}{5}$ as a mixed number.

.....

**(1)**

(b) Circle the two fractions that are equivalent.

$\frac{19}{20}$ $\frac{4}{5}$ $\frac{20}{24}$ $\frac{28}{35}$ $\frac{5}{9}$

**(1)**

(c) Write 0.3 as a fraction.

.....

**(1)**

**(Total for Question 6 is 3 marks)**

**7** 2 cupcakes and 5 doughnuts cost $4.50
3 cupcakes cost $2.25

Work out the cost of 1 doughnut.

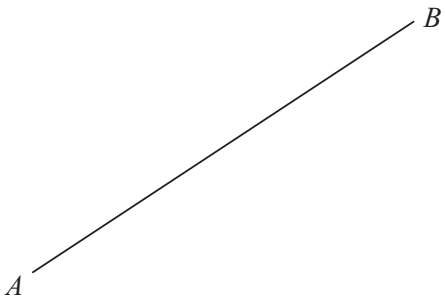
$.....

**(Total for Question 7 is 4 marks)**

**20** Show that $7\frac{1}{3} - 3\frac{4}{7} = 3\frac{16}{21}$

**(Total for Question 20 is 3 marks)**

**21** Using ruler and compasses only, construct the perpendicular bisector of the line $AB$
Show all your construction lines.




**(Total for Question 21 is 2 marks)**

**11** Benson was on holiday in Kenya for 70 days.

He was in Nairobi for $\frac{2}{7}$ of this holiday.

He was in Mombasa for $\frac{1}{5}$ of this holiday.

He was in Kisumu for $\frac{4}{9}$ of the **rest** of this holiday.

For what fraction of this holiday was Benson in Kisumu?

**(Total for Question 11 is 4 marks)**

**2** (a) Write these fractions in order of size.
Start with the smallest fraction.

$$\frac{1}{6} \quad \frac{1}{10} \quad \frac{3}{4} \quad \frac{1}{2}$$

**(1)**

(b) Write $\frac{1}{4}$ as a decimal.

**(1)**

(c) Write $\frac{1}{5}$ as a percentage.

%

**(1)**

(d) Work out $1 - \frac{5}{8}$

**(1)**

**(Total for Question 2 is 4 marks)**

**17** There are 60 children in a club.

In the club, the ratio of the number of girls to the number of boys is 3 : 1

$\frac{3}{5}$ of the girls play a musical instrument.

$\frac{4}{5}$ of the boys play a musical instrument.

What fraction of the 60 children play a musical instrument?

**(Total for Question 17 is 4 marks)**

**5** There are 12 481 people at a concert.
8906 of these people are adults.
The rest of the people are children.

$\frac{3}{5}$ of the children are boys.

Work out the number of girls at the concert.

.....

**(Total for Question 5 is 4 marks)**

**6** (a) Simplify $6e \times 2f$

.....

(1)

(b) Simplify $5m + 7k - 2m + k$

.....

(2)

(c) Solve $5y + 3 = 14$

$y =$ .....

(2)

**(Total for Question 6 is 5 marks)**

**17** Pieter owns a currency conversion shop.

Last Monday, Pieter changed a total of 20 160 rand into a number of different currencies.

He changed $\frac{3}{10}$ of the 20 160 rand into euros.

He changed the rest of the rands into dollars, rupees and francs in the ratios 9 : 5 : 2

Pieter changed more rands into dollars than he changed into francs.

Work out how many more.

..... rand

**(Total for Question 17 is 4 marks)**

**6** Mikhal has 1200 grams of cake mixture.

He is going to make 3 cakes, cake *A*, cake *B* and cake *C*.

$\frac{4}{15}$ of the weight of the cake mixture will be used to make cake *A*.

The rest of the cake mixture will be used to make cake *B* and cake *C*.

The weight of the cake mixture used to make cake *B* and the weight of the cake mixture used to make cake *C* will be in the ratio 3 : 8

Work out the weight of the cake mixture used to make each of cake *A*, cake *B* and cake *C*.

Cake *A* ..... grams

Cake *B* ..... grams

Cake *C* ..... grams

**(Total for Question 6 is 4 marks)**

**10** (a) Show that $\frac{3}{10} \div \frac{1}{4} = \frac{6}{5}$

**(2)**

(b) Show that $\frac{5}{6} - \frac{3}{4} = \frac{1}{12}$

**(2)**

**(Total for Question 10 is 4 marks)**

**11** (a) Use your calculator to work out the value of $\frac{2.14^3 - 3.76}{\sqrt{1.24}}$

Write down all the figures on your calculator display.

.....

**(2)**

(b) Write your answer to part (a) correct to 2 significant figures.

.....

**(1)**

**(Total for Question 11 is 3 marks)**

**16** (a) Show that $\frac{3}{8} \div \frac{27}{32} = \frac{4}{9}$

**(2)**

(b) Show that $\frac{5}{6} - \frac{3}{8} = \frac{11}{24}$

**(2)**

**(Total for Question 16 is 4 marks)**

**4** (a) Write 0.7 as a fraction.

.....

**(1)**

(b) Write a number in the box so that the following statement is correct.

$\frac{3}{4}$ and $\frac{\square}{20}$ are equivalent fractions.

**(1)**

(c) Work out $\frac{3}{5}$ of 35

.....

**(2)**

**(Total for Question 4 is 4 marks)**

**13** There are 380 students in a Sixth Form.
The students are either in the Upper Sixth or in the Lower Sixth.

The number of students in the Upper Sixth is 20 fewer than the number of students in the Lower Sixth.

$\frac{2}{5}$ of the Upper Sixth students study mathematics.

32% of the Lower Sixth students study mathematics.

Work out the total number of students in the Sixth Form who study mathematics.

.....

**(Total for Question 13 is 4 marks)**

**11** Asif has 200 beads.

Asif gives $\frac{1}{4}$ of the 200 beads to Bernadette.

Asif gives $\frac{2}{5}$ of the 200 beads to Claudio.

Asif gives 43 beads to Derek.

What fraction of the 200 beads does Asif have left?

.....

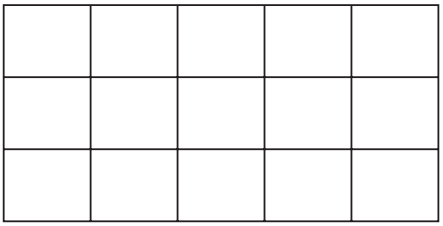
**(Total for Question 11 is 4 marks)**

**Answer ALL TWENTY FOUR questions.**

**Write your answers in the spaces provided.**

**You must write down all the stages in your working.**

**1** (a) Shade $\frac{4}{5}$ of this shape.



**(1)**

(b) Write $\frac{27}{36}$ as a fraction in its simplest form.

.....

**(1)**

(c) Write $\frac{3}{100}$ as a decimal.

.....

**(1)**

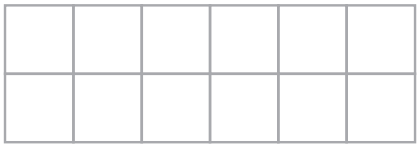
(d) Write $\frac{7}{50}$ as a percentage.

.....%

**(1)**

**(Total for Question 1 is 4 marks)**

**5** Here is a shape made of squares.



(a) Shade $\frac{2}{3}$ of the shape.

**(1)**

(b) Write $\frac{3}{10}$ as a percentage.

.....%

**(1)**

(c) Write $\frac{48}{150}$ as a fraction in its simplest form.

.....

**(1)**

(d) Write $\frac{46}{7}$ as a mixed number.

.....

**(1)**

**(Total for Question 5 is 4 marks)**

**Answer ALL TWENTY ONE questions.**

**Write your answers in the spaces provided.**

**You must write down all the stages in your working.**

**1** (a) Write $\frac{7}{100}$ as a decimal.

.....

**(1)**

(b) Write $\frac{48}{60}$ as a fraction in its simplest form.

.....

**(1)**

(c) Write $\frac{17}{3}$ as a mixed number.

.....

**(1)**

There are 840 tickets available for a concert.

$\frac{1}{7}$ of these tickets have **not** been sold.

(d) How many of the tickets have been sold?

.....

**(2)**

**(Total for Question 1 is 5 marks)**

**6** (a) Write $\frac{1}{4}$ as a decimal.

.....

**(1)**

(b) Write $\frac{34}{10}$ as a mixed number in its simplest form.

.....

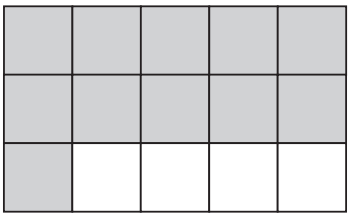
**(2)**

(c) Show that $\frac{3}{4} \div \frac{15}{16} = \frac{4}{5}$

**(2)**

**(Total for Question 6 is 5 marks)**

**4** Here is a shape made from squares.



(a) What fraction of this shape is shaded?

.....

(1)

(b) Write $\frac{23}{5}$ as a mixed number.

.....

(1)

(c) Write 0.23 as a fraction.

.....

(1)

(d) Write $\frac{2}{5}$ as a decimal.

.....

(1)

(e) Write these decimals in order of size.
Start with the smallest decimal.

3.61 3.9 3.555 3.82 3.7

.....

(1)

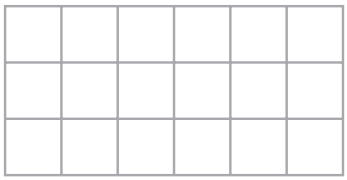
**(Total for Question 4 is 5 marks)**

**Answer ALL TWENTY SEVEN questions.**

**Write your answers in the spaces provided.**

**You must write down all the stages in your working.**

**1** Here is a shape made of squares.



(a) Shade $\frac{1}{6}$ of the shape.

**(1)**

(b) Change $\frac{19}{5}$ into a mixed number.

.....

**(1)**

$\frac{7}{11}$ of a class walk to school.

(c) What fraction of the class do **not** walk to school?

.....

**(1)**

(d) Write down a fraction that is equivalent to $\frac{7}{9}$

.....

**(1)**

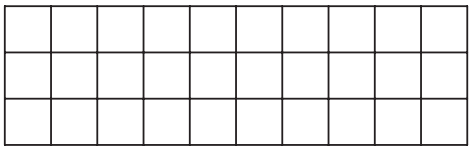
(e) Write 0.03 as a fraction.

.....

**(1)**

**(Total for Question 1 is 5 marks)**

**4** A rectangle is made from 30 small coloured square tiles.



There are yellow tiles, blue tiles and red tiles.

30% of the rectangle is made from yellow tiles.

$\frac{1}{3}$ of the rectangle is made from blue tiles.

The rest of the rectangle is made from red tiles.

(a) Work out the number of red tiles.

.....

**(3)**

(b) Put the following numbers in order of size.
Start with the smallest number.

0.76 25% 0.0766 8% 0.026

.....

**(2)**

**(Total for Question 4 is 5 marks)**

**2** (a) Write $\frac{4}{5}$ as a decimal.

.....

**(1)**

(b) Write $\frac{77}{9}$ as a mixed number.

.....

**(1)**

(c) Write $\frac{35}{45}$ as a fraction in its simplest form.

.....

**(1)**

(d) Write these decimals in order of size.

4.81 4.013 4.85 4.807 4.02

Start with the smallest decimal.

.....

**(1)**

(e) Find the sum of $\frac{13}{20}$ and 0.72

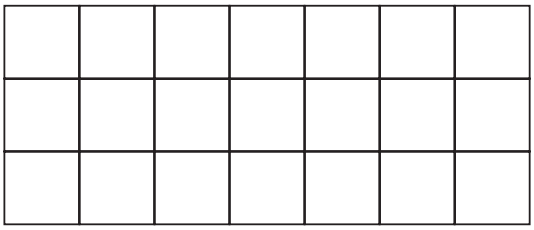
Give your answer as a decimal.

.....

**(2)**

**(Total for Question 2 is 6 marks)**

**3** (a) Shade $\frac{3}{7}$ of the rectangle.



**(1)**

(b) Write $\frac{23}{3}$ as a mixed number.

**(1)**

(c) Find $\frac{2}{5}$ of 60 cm.

cm

**(2)**

Claude says that $\frac{1}{6}$ is exactly halfway between $\frac{1}{4}$ and $\frac{1}{8}$

(d) Is Claude correct?
You must give a reason for your answer.

**(2)**

**(Total for Question 3 is 6 marks)**

**14** Iona buys a box of cereal.

The cereal in the box weighs 0.75 kg.
Each helping of the cereal eaten by Iona has a weight of 40 g.

(a) Write 40 g as a fraction of 0.75 kg.
Give your answer in its simplest form.

.....

**(2)**

The cereal in the box contains 6.8 g of protein for each 100 g of cereal.

(b) Work out the amount of protein in each of Iona's helpings of cereal.

..... g

**(2)**

3 g of every 40 g helping of cereal is fat.

(c) Write 3 g as a percentage of 40 g.

..... %

**(2)**

**(Total for Question 14 is 6 marks)**

**6** Here is a shape made of squares.



(a) Shade $\frac{3}{5}$ of the shape.

**(1)**

(b) Write $\frac{36}{120}$ as a fraction in its simplest form.

.....

**(1)**

(c) Write these fractions in order of size.
Start with the smallest fraction.

$$\frac{3}{4} \quad \frac{5}{6} \quad \frac{1}{2} \quad \frac{4}{5}$$

.....

**(2)**

$\frac{5}{9}$ of a number is 14

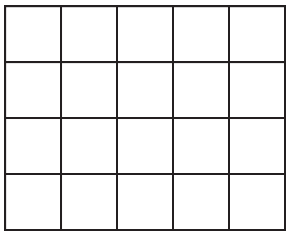
(d) What is the number?

.....

**(2)**

**(Total for Question 6 is 6 marks)**

**5** Here is a shape made of squares.



(a) Shade $\frac{3}{5}$ of the shape.

**(1)**

(b) Which one of these fractions is **not** equivalent to $\frac{4}{7}$?

$\frac{40}{70}$ $\frac{8}{14}$ $\frac{400}{700}$ $\frac{14}{17}$ $\frac{20}{35}$

.....

**(1)**

(c) Write $\frac{3}{10}$ as a percentage.

..... %

**(1)**

(d) Write $\frac{77}{9}$ as a mixed number.

.....

**(1)**

$\frac{5}{6}$ of a number is 40

(e) What is the number?

.....

**(2)**

**(Total for Question 5 is 6 marks)**

**8** (a) Write $\frac{19}{5}$ as a mixed number.

**(1)**

There are 84 animals in a field.

10 of the animals are horses.
45 of the animals are sheep.
The rest of the animals are cows.

(b) What fraction of the animals in the field are cows?

**(2)**

(c) Write these fractions in order of size.
Start with the smallest fraction.

$\frac{3}{4}$ $\frac{11}{12}$ $\frac{5}{8}$ $\frac{9}{20}$

**(2)**

(d) Show that $\frac{23}{24} - \frac{3}{8} = \frac{7}{12}$

**(2)**

**(Total for Question 8 is 7 marks)**

**9** (a) Write these fractions in order of size.
Start with the smallest fraction.

$$\frac{7}{10} \quad \frac{4}{5} \quad \frac{1}{2} \quad \frac{29}{40}$$

.....

**(2)**

(b) Show that $\frac{8}{15} + \frac{3}{10} = \frac{5}{6}$

**(2)**

(c) Show that $4\frac{2}{3} \div 1\frac{1}{9} = 4\frac{1}{5}$

**(3)**

**(Total for Question 9 is 7 marks)**

**9** (a) Work out $16 \div 4 + 3 \times 8$

.....

**(1)**

(b) Find the cube root of 5832

.....

**(1)**

(c) Write 85% as a decimal.

.....

**(1)**

(d) Write these fractions in order of size.
Start with the smallest fraction.

$\frac{3}{4}$ $\frac{2}{5}$ $\frac{7}{15}$ $\frac{2}{3}$

.....

**(2)**

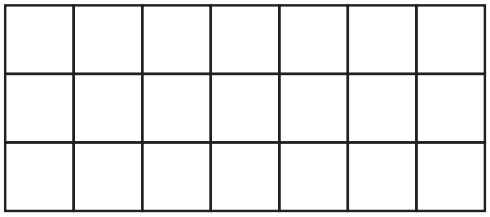
(e) Write 36 as a fraction of 96
Give your fraction in its simplest form.

.....

**(2)**

**(Total for Question 9 is 7 marks)**

**4** Here is a rectangle made of squares.



(a) Shade $\frac{3}{7}$ of the rectangle.

**(1)**

Here are five fractions.

$$\frac{33}{43} \quad \frac{18}{24} \quad \frac{16}{20} \quad \frac{21}{27} \quad \frac{12}{16}$$

(b) Write down the two fractions that are equivalent to $\frac{3}{4}$

..... and .....

**(2)**

(c) Write $\frac{24}{7}$ as a mixed number.

.....

**(1)**

(d) Write $\frac{9}{10}$ as a percentage.

..... %

**(1)**

There are 80 crayons in a box.

$\frac{2}{5}$ of the crayons are red.

(e) Work out the number of crayons that are **not** red.

.....

**(2)**

**(Total for Question 4 is 7 marks)**

**6** (a) Write $\frac{24}{40}$ as a fraction in its simplest form.

.....

**(2)**

(b) Write $\frac{1}{5}$ as a decimal.

.....

**(1)**

There are only blue bricks and white bricks in a box.
The ratio of the number of blue bricks to the number of white bricks is 3 : 7

(c) What fraction of the bricks in the box are blue bricks?

.....

**(1)**

(d) Show that $\frac{3}{8} + \frac{1}{24} = \frac{5}{12}$

**(2)**

There are 280 counters in a bag.

$\frac{1}{2}$ of the counters are red.

$\frac{2}{5}$ of the counters are yellow.

The rest of the counters are green.

(e) Work out the number of green counters in the bag.

.....

**(3)**

**(Total for Question 6 is 9 marks)**

SUB-TOPIC N2b

# DECIMALS & CONVERSIONS

Sub-topic N2b · 25 questions · 114 marks · lowest tariff first

**3** Find the number that is exactly halfway between 3.7 and 6.1

.....

**(Total for Question 3 is 2 marks)**

**4** (a) Simplify $3 \times 10d$

.....

(1)

(b) Simplify $8e + e - 5e$

.....

(1)

(c) Solve $6g = 42$

$g =$ .....

(1)

(d) Solve $24 = 10 + h$

$h =$ .....

(1)

**(Total for Question 4 is 4 marks)**

**Answer ALL TWENTY FOUR questions.**

**Write your answers in the spaces provided.**

**You must write down all the stages in your working.**

**1**

| 6 | 15 | 19 | 28 | 38 | 44 | 48 |
|---|---|---|---|---|---|---|

From the numbers in the box, write down

(a) an odd number

.....

**(1)**

(b) a multiple of 12

.....

**(1)**

(c) a prime number

.....

**(1)**

(d) a factor of 24

.....

**(1)**

**(Total for Question 1 is 4 marks)**

**2** (a) Write 0.13 as a fraction.

.....

**(1)**

(b) Write a number in the box to make the statement correct.

$$\frac{16}{20} = \frac{\square}{5}$$

**(1)**

**(Total for Question 2 is 2 marks)**

**Answer ALL TWENTY SEVEN questions.**

**Write your answers in the spaces provided.**

**You must write down all the stages in your working.**

**1** Here is a list of numbers

13 14 18 23 30 36

From the numbers in the list, write down

(i) an odd number

.....

**(1)**

(ii) the multiple of 4

.....

**(1)**

(iii) the factor of 28

.....

**(1)**

**(Total for Question 1 is 3 marks)**

**2** (a) Write these decimals in order of size.
Start with the smallest decimal.

0.501 0.51 0.5 0.55

.....

**(1)**

(b) Write 0.3 as a fraction.

.....

**(1)**

(c) Write 0.46832 correct to 2 decimal places.

.....

**(1)**

**(Total for Question 2 is 3 marks)**

**11** (a) Use your calculator to work out the value of

$$\frac{7.45}{4.3^2 - 2.9}$$

Give your answer as a decimal.
Write down all the figures on your calculator display.

.....

**(2)**

(b) Write your answer to part (a) correct to 3 decimal places.

.....

**(1)**

**(Total for Question 11 is 3 marks)**

**12** Alisa, Jena and Mikael each pick cucumbers.

Alisa picks $C$ cucumbers.
Jena picks 5 fewer cucumbers than Alisa.
Mikael picks twice as many cucumbers as Alisa.

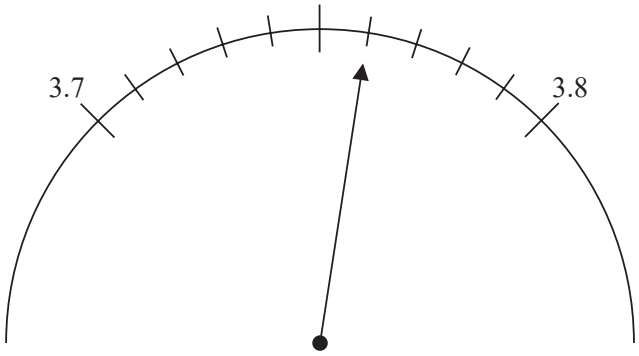
The total number of cucumbers picked by Alisa, Jena and Mikael is $T$

Find a formula for $T$ in terms of $C$
Give your formula in its simplest form.

.....

**(Total for Question 12 is 3 marks)**

**3**

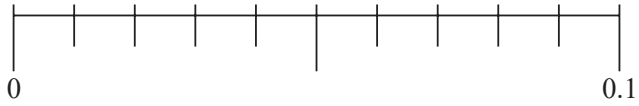



(a) Write down the number marked with the arrow on the scale above.

.....

**(1)**

(b) Mark with an arrow (↑) the number 0.04 on the scale below.




**(1)**

(c) Write the number 5.68 correct to one decimal place.

.....

**(1)**

**(Total for Question 3 is 3 marks)**

**5** Here is a list of fractions.

$$\frac{4}{5} \qquad \frac{3}{8} \qquad \frac{2}{3} \qquad \frac{12}{15} \qquad \frac{7}{10}$$

One fraction from the list, when written as a decimal, is **not** a terminating decimal.

(a) Write down this fraction.

.....

**(1)**

Two fractions from the list are equivalent.

(b) Write down these two fractions.

..... and .....

**(1)**

(c) Write $\frac{7}{10}$ as a decimal.

.....

**(1)**

**(Total for Question 5 is 3 marks)**

**12** In an orchard, there are 240 fruit trees.
There are only apple trees and pear trees such that

number of apple trees : number of pear trees = 5 : 3

64% of the apple trees produce cooking apples.

Work out the number of apple trees that produce cooking apples.

.....

**(Total for Question 12 is 4 marks)**

**13** (a) Use your calculator to work out the value of $\frac{7.93 - 2.34^2}{0.14}$

Give your answer as a decimal.
Write down all the figures on your calculator display.

.....

**(2)**

(b) Write your answer to part (a) correct to one decimal place.

.....

**(1)**

**(Total for Question 13 is 3 marks)**

**Answer ALL TWENTY FOUR questions.**

**Write your answers in the spaces provided.**

**You must write down all the stages in your working.**

**1** (a) Write 0.63 as a fraction.

.....

**(1)**

(b) Write 46 821 correct to the nearest 100

.....

**(1)**

(c) Write 73.654 correct to 1 decimal place.

.....

**(1)**

(d) Write 0.09 as a percentage.

..... %

**(1)**

**(Total for Question 1 is 4 marks)**

**2** (a) Write these numbers in order of size.
Start with the smallest number.

2.12 2.19 2.07 2.1 2.001

.....

(1)

(b) Write down the value of 6 in the number 54.623

.....

(1)

(c) Write the number 3.4896 correct to 2 decimal places.

.....

(1)

(d) Write 0.6 as a percentage.

.....%

(1)

**(Total for Question 2 is 4 marks)**

**3** (a) Simplify $4x + 5x - 2x$

.....

(1)

(b) Simplify $4p \times 7$

.....

(1)

**(Total for Question 3 is 2 marks)**

**3** (a) Write 0.03 as a fraction.

.....

(1)

(b) Write 0.9 as a percentage.

..... %

(1)

(c) Write these decimals in order of size.
Start with the smallest decimal.

0.4 0.48 0.204 0.24 0.408

.....

(1)

(d) Work out $0.93 + \frac{7}{10}$

Give your answer as a decimal.

.....

(1)

**(Total for Question 3 is 4 marks)**

**4** (a) Simplify $4 \times 5e$

.....

**(1)**

(b) Solve $f + 14 = 29$

$f =$ .....

**(1)**

**(Total for Question 4 is 2 marks)**

**5** (a) Write 0.6 as a percentage.

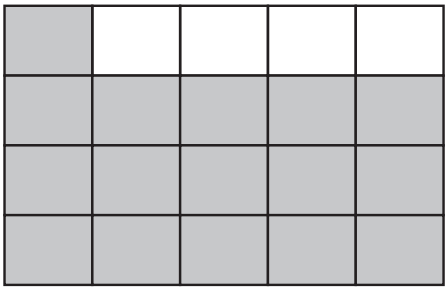
..... %

**(1)**

(b) Write $\frac{19}{100}$ as a decimal.

.....

**(1)**



(c) What fraction of this shape is shaded?
Write your fraction in its simplest form.

.....

**(2)**

**(Total for Question 5 is 4 marks)**

**Answer ALL TWENTY SEVEN questions.**

**Write your answers in the spaces provided.**

**You must write down all the stages in your working.**

**1** (a) Write these numbers in order of size.
Start with the smallest number.

83 148 46 229 99

.....

**(1)**

(b) Write these decimals in order of size.
Start with the smallest decimal.

0.25 0.5 0.46 0.08 0.417

.....

**(1)**

(c) Write 0.81 as a fraction.

.....

**(1)**

(d) Find the number that is exactly halfway between 0.2 and 0.3

.....

**(1)**

**(Total for Question 1 is 4 marks)**

**Answer ALL TWENTY FOUR questions.**

**Write your answers in the spaces provided.**

**You must write down all the stages in your working.**

**1** (a) Write $\frac{23}{100}$ as a decimal.

**(1)**

(b) Write 0.7 as a percentage.

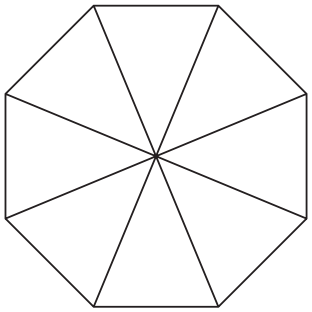
%

**(1)**

(c) Write $\frac{1}{5}$ as a decimal.

**(1)**

(d) Shade 75% of this diagram.



**(1)**

21% of the people on a train are asleep.

(e) What percentage of the people on the train are not asleep?

%

**(1)**

**(Total for Question 1 is 5 marks)**

**Answer ALL TWENTY FIVE questions.**

**Write your answers in the spaces provided.**

**You must write down all the stages in your working.**

**1** (a) Write these decimals in order of size.
Start with the smallest decimal.

7.831 7.04 7.002 7.9 7.013

(1)

(b) Write 7% as a decimal.

(1)

(c) Write 0.47 as a fraction.

(1)

(d) Write 0.63 as a percentage.

%

(1)

(e) Write a number in the box to make the calculation correct.

$0.003 \times \square = 9$

(1)

**(Total for Question 1 is 5 marks)**

**5** (a) Write these decimals in order of size.
Start with the smallest decimal.

0.9 0.035 0.003 0.539 0.5

.....

**(1)**

(b) Write 0.6 as a percentage.

..... %

**(1)**

(c) Write $\frac{60}{7}$ as a mixed number.

.....

**(1)**

(d) Work out the difference between $\frac{19}{20}$ and 0.68

Give your answer as a decimal.

.....

**(2)**

**(Total for Question 5 is 5 marks)**

**4** (a) Write 0.57 as a fraction.

.....

**(1)**

(b) Write 0.02 as a percentage.

.....%

**(1)**

(c) Write $\frac{72}{84}$ as a fraction in its simplest form.

.....

**(1)**

(d) Write $\frac{22}{5}$ as a mixed number.

.....

**(1)**

(e) Work out $\frac{1}{8}$ of 624

.....

**(1)**

**(Total for Question 4 is 5 marks)**

**3** Here is a rectangle made from squares.



(a) Shade 0.7 of the rectangle.

**(1)**

(b) Write down the value of the 2 in the number 3.289

.....

**(1)**

(c) Write $\frac{5}{8}$ as a decimal.

.....

**(1)**

(d) Write these numbers in order of size.
Start with the smallest number.

2.803 2.008 2.081 2.83 2.8

.....

**(2)**

**(Total for Question 3 is 5 marks)**

**5** (a) Work out $\frac{4}{5}$ of 80

.....

**(1)**

(b) Write $\frac{9}{20}$ as a decimal.

.....

**(1)**

Here are four fractions.

$$\frac{1}{3} \qquad \frac{2}{9} \qquad \frac{3}{8} \qquad \frac{4}{11}$$

When written as a decimal, **one** of these fractions will give a terminating decimal.

(c) Write down the fraction.

.....

**(1)**

(d) Write $\frac{11}{4}$ as a mixed number in its simplest form.

.....

**(1)**

Here is a list of four words that can be used to describe numbers.

| | | | |
|---|---|---|---|
| cube | square | prime | negative |

(e) Use the word from the list to complete the sentence below correctly.

25 is a ..... number

**(1)**

**(Total for Question 5 is 5 marks)**

**4** (a) Write 0.8 as a percentage.

..... %

**(1)**

(b) Write down the value of the 3 in the number 4.7634

.....

**(1)**

(c) Write these decimals in order of size.
Start with the smallest decimal.

0.204 0.24 0.04 0.2 0.042

.....

**(1)**

(d) Write 25.78621 correct to 2 decimal places.

.....

**(1)**

(e) Find the square root of 1296

.....

**(1)**

**(Total for Question 4 is 5 marks)**

7 (a) Write these decimals in order of size.
Start with the smallest decimal.

0.5 0.54 0.45 0.504 0.405

.....

(1)

(b) Write 0.08 as a percentage.

.....%

(1)

(c) Write $\frac{31}{9}$ as a mixed number.

.....

(1)

(d) Find the number that is exactly halfway between $\frac{7}{25}$ and 0.88

.....

(2)

**(Total for Question 7 is 5 marks)**

**4** (a) Write $\frac{9}{10}$ as a decimal.

.....

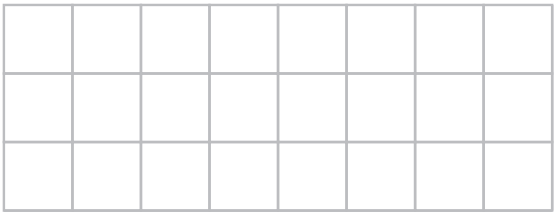
**(1)**

(b) Write $\frac{3}{50}$ as a percentage.

.....%

**(1)**

Here is a shape made of squares.



(c) Shade $\frac{5}{8}$ of the shape.

**(1)**

(d) One of these fractions is **not** equivalent to $\frac{2}{5}$

Which one?

$\frac{20}{50}$ $\frac{4}{10}$ $\frac{2}{500}$ $\frac{10}{25}$ $\frac{60}{150}$

.....

**(1)**

There are 32 students in a class.
8 of the students study French.

(e) What fraction of the students do **not** study French?
Give your fraction in its simplest form.

.....

**(2)**

**(Total for Question 4 is 6 marks)**

**3** (a) Write 0.72 as a fraction.
Give your fraction in its simplest form.

.....

**(2)**

(b) Write $\frac{3}{4}$ as a percentage.

.....%

**(1)**

(c) Work out 65% of 720

.....

**(2)**

(d) Write these numbers in order of size.
Start with the smallest number.

0.43 $\frac{9}{20}$ 40.5% $\frac{4}{9}$ 0.427

.....

**(2)**

**(Total for Question 3 is 7 marks)**

**5** (a) Write these numbers in order of size.

Start with the smallest number.

2.08 2.13 2.7 2.0034 2.111

.....

**(1)**

(b) Write 5.8394 correct to 2 decimal places.

.....

**(1)**

(c) Write 0.73 as a fraction.

.....

**(1)**

(d) Write down the value of the 6 in the number 0.067

.....

**(1)**

(e) Write 17% as a decimal.

.....

**(1)**

70% of a number is 252

(f) Work out the number.

.....

**(2)**

**(Total for Question 5 is 7 marks)**

**Answer ALL TWENTY EIGHT questions.**

**Write your answers in the spaces provided.**

**You must write down all the stages in your working.**

**1** (a) Write 0.3 as a percentage.

..... %

**(1)**

(b) Write $\frac{29}{100}$ as a decimal.

.....

**(1)**

(c) Write $\frac{17}{20}$ as a decimal.

.....

**(1)**

(d) Write these numbers in order of size.
Start with the smallest number.

−7 8 −9 16 −3

.....

**(1)**

(e) Write these numbers in order of size.
Start with the smallest number.

0.044 0.104 0.04 0.009 0.2

.....

**(1)**

There are 400 cars in a car park.

$\frac{3}{10}$ of the cars are grey.

(f) Work out how many of the cars in the car park are **not** grey.

.....

**(2)**

**(Total for Question 1 is 7 marks)**

**6** (a) Write these numbers in order of size.
Start with the smallest number.

0.47 0.4 0.74 0.477 0.407

.....

**(1)**

(b) Write 0.7 as a fraction.

.....

**(1)**

(c) Write 30 as a fraction of 48
Give your fraction in its simplest form.

.....

**(2)**

(d) Write 23% as a decimal.

.....

**(1)**

Rita has some beads in a bag.

Of these beads, Rita gives

$\frac{1}{2}$ to Sheng

and $\frac{2}{5}$ to Tusco

Rita now has 3 beads left in the bag.

(e) Work out how many beads Rita originally had in the bag.

.....

**(3)**

**(Total for Question 6 is 8 marks)**

**7** (a) Simplify $3c + 5d - c + 2d$

.....

**(2)**

(b) Simplify $8e \times 5f$

.....

**(1)**

(c) Solve $5r - 3 = 8$

$r =$ .....

**(2)**

**(Total for Question 7 is 5 marks)**

SUB-TOPIC N2c

# PERCENTAGES

Sub-topic N2c · 67 questions · 290 marks · lowest tariff first

**11** Work out 23% of 450 millilitres.

.....millilitres

**(Total for Question 11 is 2 marks)**

**12** (a) Write down all the factors of 9

.....

**(1)**

(b) Find the lowest common multiple (LCM) of 15 and 70

.....

**(2)**

**(Total for Question 12 is 3 marks)**

**13** One week, an online company carried out a total of 175 deals.
49 of these deals were in yen.

Work out the percentage of deals carried out in yen.

..... %

**(Total for Question 13 is 2 marks)**

**14** One month, Abbad raised money for charity by being sponsored to run and to walk.
His target was to raise 700 dirhams.

During the month, Abbad recorded a total distance of 135 km by running and by walking.
The ratio

number of km he ran : number of km he walked = 2 : 7

Abbad received 8 dirhams for each km he ran and 5 dirhams for each km he walked.

Abbad raised more money than his 700 dirhams target.

How much more?

..... dirhams

**(Total for Question 14 is 4 marks)**

**15** Jill scored 119 out of 140 marks in an exam.

Work out Jill's score as a percentage.

.....%

**(Total for Question 15 is 2 marks)**

**16** Find the lowest common multiple (LCM) of 45 and 70

.....

**(Total for Question 16 is 2 marks)**

**17** Here are the first five terms of a number sequence $S$.

10 16 22 28 34

(a) Find an expression, in terms of $n$, for the $n$th term of this sequence.

**(2)**

The $n$th term of a sequence $T$ is given by $n^2 - 3$

There are numbers that are terms in both the sequence $S$ and the sequence $T$.

(b) Find one of these numbers.

**(2)**

**(Total for Question 17 is 4 marks)**

**18** On Saturday, Jacob walked 10 800 steps.
On Sunday, he walked 7% more steps than on Saturday.

Work out how many steps Jacob walked on Sunday.

**(Total for Question 18 is 3 marks)**

**24** Carlos, Flavia and Tazia shared £861 between themselves.

The amount of money Flavia got is 65% of the amount of money Carlos got.
The amount of money Tazia got is 22% **more** than the amount of money Carlos got.

Work out how much money Carlos got.

£

**(Total for Question 24 is 3 marks)**

**21** In a sale, the normal price of a hat is reduced by 15%
The sale price of the hat is 20.40 euros.

Work out the normal price of the hat.

..... euros

**(Total for Question 21 is 3 marks)**

**12** In 2018, Salman saved 120 riyals each month.

At the start of 2019, Salman increased 120 riyals by 7.5%
He then saved this new amount each month during 2019

Work out how much money Salman saved in total in 2019

..... riyals

**(Total for Question 12 is 3 marks)**

**22** In a sale, normal prices are reduced by 20%

A bag costs 1080 rupees in the sale.

Work out the normal price of the bag.

..... rupees

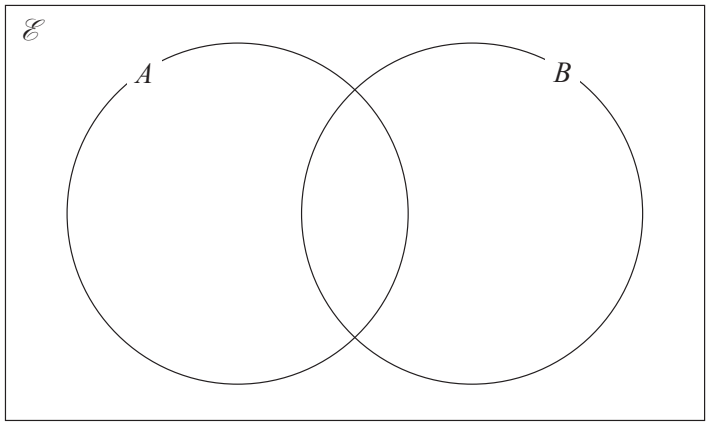
**(Total for Question 22 is 3 marks)**

**12** $\mathscr{E}$ = {whole numbers from 1 to 15}

$A$ = {even numbers}

$B$ = {3, 6, 9, 12, 15}

Complete the Venn diagram for the sets $\mathscr{E}$, $A$ and $B$.




**(Total for Question 12 is 3 marks)**

**13** Find which is larger

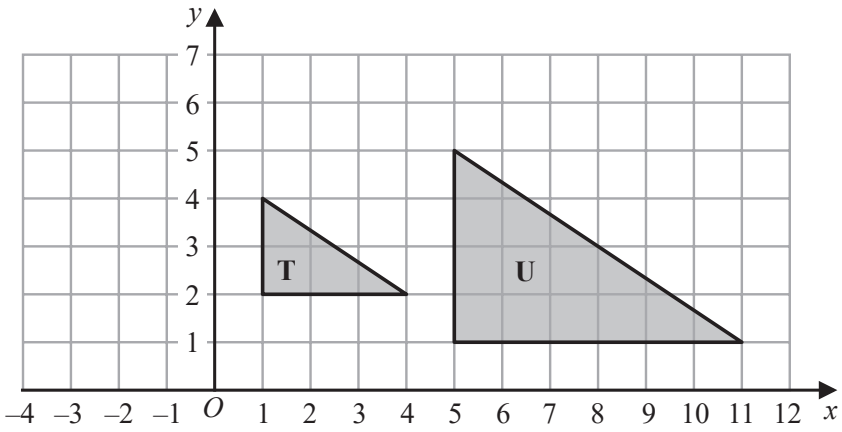
32% of 450 or $\frac{2}{5}$ of 375

You must show all your working.

.....

**(Total for Question 13 is 3 marks)**

Here are triangle **T** and triangle **U** drawn on a grid of squares.




(c) Describe fully the single transformation that maps triangle **T** onto triangle **U**.

.....

.....

**(3)**

**(Total for Question 16 is 6 marks)**

**17** On Wednesday, the price of 1 litre of petrol was £1.26
The price of petrol on Wednesday was 5% more than the price of petrol on the previous Monday.

Calculate the price of 30 litres of petrol on the previous Monday.

£.....

**(Total for Question 17 is 3 marks)**

**20** In 2018, the population of Sydney was 5.48 million.
This was 22% of the total population of Australia.

Work out the total population of Australia in 2018
Give your answer correct to 3 significant figures.

..... million

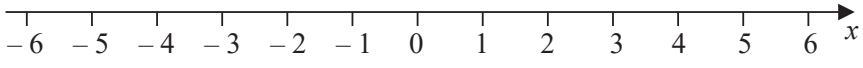
**(Total for Question 20 is 3 marks)**

**21** (i) Solve the inequalities $-7 \leqslant 2x - 3 < 5$

.....

**(3)**

(ii) On the number line, represent the solution set to part (i)




**(2)**

**(Total for Question 21 is 5 marks)**

**22** Victor buys 12 bottles of apple juice for a total cost of $21
Victor sells all 12 bottles at $2.45 each bottle.

Work out Victor's percentage profit.

.....%

**(Total for Question 22 is 3 marks)**

**11** At school each week, Gabriella has to play a sport on Monday and a sport on Thursday.

The table shows the sports from which she can choose on Monday and the sports from which she can choose on Thursday.

| Monday | Thursday |
|---|---|
| Tennis (T) | Volleyball (V) |
| Netball (N) | Badminton (B) |
| Hockey (H) | Tennis (T) |

Write down all the possible combinations of these sports that Gabriella can play in one week.

.....

.....

.....

**(Total for Question 11 is 2 marks)**

**12** Maria is going to make some flapjacks.

Here are four of the ingredients that she will use.

175 g butter
175 g syrup
175 g sugar
330 g oats

What percentage of these four ingredients is oats?
Give your answer correct to 3 significant figures.

..... %

**(Total for Question 12 is 3 marks)**

**24** $\frac{2^k}{4^n} = 2^x$

Find an expression for $x$ in terms of $k$ and $n$

$x =$ .....

**(Total for Question 24 is 2 marks)**

**25** A cinema increased the cost of an adult ticket by 12%

After the increase, the cost of an adult ticket was £18.20

Work out the cost of an adult ticket before the increase.

£.....

**(Total for Question 25 is 3 marks)**

**18** Find the highest common factor (HCF) of 72 and 108
Show your working clearly.

.....

**(Total for Question 18 is 2 marks)**

**19** Ava records the number of kilometres she drives each month.

In April, Ava drove 943 kilometres.
This is 15% more than the number of kilometres she drove in March.

Work out the number of kilometres Ava drove in March.

..... kilometres

**(Total for Question 19 is 3 marks)**

**23** $\dfrac{3^{-2} \times 3^{5}}{3^{10}} = 3^{n}$

Find the value of $n$

$n =$ .....

**(Total for Question 23 is 2 marks)**

**24** In a sale, all normal prices are reduced by 17%

The sale price of a fridge is 6225 rupees.

Work out the normal price of the fridge.

..... rupees

**(Total for Question 24 is 3 marks)**

**21** $x^5 \times x^7 = x^m$

(a) Find the value of $m$

$m =$ .....

**(1)**

$y^8 \div y^3 = y^n$

(b) Find the value of $n$

$n =$ .....

**(1)**

(c) Simplify fully $(5a^4r^2)^3$

.....

**(2)**

**(Total for Question 21 is 4 marks)**

**22** In a sale, normal prices are reduced by 28%
The sale price of a watch is 198 euros.

Work out the normal price of the watch.

..... euros

**(Total for Question 22 is 3 marks)**

**13** Work out the value of $\dfrac{9.75-1.4^2}{9.2+\sqrt{6.3}}$

Write down all the figures on your calculator display.

.....

**(Total for Question 13 is 2 marks)**

**14** A company makes cars.

The company makes 125 cars each hour for 9 hours a day.
The company makes cars for 5 days each week.

24% of the cars the company makes are red.

Work out the number of red cars that the company makes each week.

.....

**(Total for Question 14 is 3 marks)**

**24** Tim buys a bracelet for 4000 Swiss francs.
The value of the bracelet increases by 7% each year.

Work out the value of the bracelet at the end of 3 years.
Give your answer correct to the nearest Swiss franc.

..... Swiss francs

**(Total for Question 24 is 3 marks)**

**25** Solve the simultaneous equations

$$3x + 5y = 8$$
$$4x + y = -3.5$$

Show clear algebraic working.

$x =$ .....

$y =$ .....

**(Total for Question 25 is 3 marks)**

**25** In a sale, normal prices are reduced by 15%

The sale price of a dishwasher is 612 Swiss francs.

Work out the normal price of the dishwasher.

..... Swiss francs

**(Total for Question 25 is 3 marks)**

**26** A straight line, **L**, is parallel to the line with equation $y = 2 - 5x$
The line **L** passes through the point (0, 6)

Find an equation of the line **L**

.....

**(Total for Question 26 is 2 marks)**

**15** There are 440 students at a school.
The number of male students is 40 more than the number of female students.

65% of the male students like art.
85% of the female students like art.

Work out the total number of students at the school who like art.

.....

**(Total for Question 15 is 4 marks)**

**16** Work out the difference between the largest share and the smallest share when 3450 yen is divided in the ratios 2 : 6 : 7

..... yen

**(Total for Question 16 is 3 marks)**

**17** Gopal is paid 20 000 rupees each month.
Jamuna is paid 19 200 rupees each month.

Gopal and Jamuna are both given an increase in their monthly pay.
After the increase, they are both paid the same amount each month.

Gopal was given an increase of 8%

Work out the percentage increase that Jamuna was given.

.....%

**(Total for Question 17 is 4 marks)**

**18** Behnaz makes candles.

She has 6.3 kilograms of wax and uses it all to make candles.
Each candle Behnaz makes uses 210 grams of wax.

Behnaz sells $\frac{2}{5}$ of the candles for \$13 each.

She then reduces this price by 20% and sells the rest of the candles.

Work out the total amount of money Behnaz gets by selling all the candles she made.

\$.....

**(Total for Question 18 is 4 marks)**

**7** Juan and Gabriella and their two children are going on a train journey from Madrid.

The cost of an adult ticket for this train journey is 53.50 euros.
The cost of a child ticket for this train journey is 60% of the cost of the adult ticket.

Juan buys 2 adult tickets and 2 child tickets.
He pays with two 100 euro notes.

How much change should he get?

euros

**(Total for Question 7 is 4 marks)**

**8** (a) Simplify $5x + 4y - x - y$

**(2)**

(b) Solve $2t + 3 = 12$

$t =$

**(2)**

**(Total for Question 8 is 4 marks)**

**14** Toy cars are made in a factory.

300 cars per hour are made in the factory.

Cars are made in the factory for $9\frac{1}{2}$ hours each day.

8% of the cars made in the factory are faulty.
The rest of the cars made in the factory are **not** faulty.

Work out how many of the cars made each day are **not** faulty.

**(Total for Question 14 is 4 marks)**

**13** Betsy was given $75 for her birthday.

She saved some of the money and spent the rest on a T-shirt and a bag.

Betsy saved 40% of the $75
She spent $12 more on the bag than she spent on the T-shirt.

Work out how much Betsy spent on the bag.

$.....

**(Total for Question 13 is 4 marks)**

**12** Gavin bought 3 pairs of jeans in the USA.
He paid a **total** of $72

Gavin sold the 3 pairs of jeans in England.
He sold each pair of jeans for £34.50

£1 = $1.34

Work out Gavin's percentage profit.
Give your answer correct to the nearest whole number.

.....%

**(Total for Question 12 is 4 marks)**

**9** In November, Andre received a monthly salary of 2500 euros.

Of this he spent

40% on his rent
300 euros on leisure

The rest of Andre's monthly salary was spent on household bills and on food where

the amount spent on household bills : the amount spent on food = 3 : 7

Work out how much of his November monthly salary Andre spent on food.

..... euros

**(Total for Question 9 is 4 marks)**

**20** The language department of a college has 180 students.
Each student studies exactly one of French, German, Italian or Spanish.

15 students study French.
45% of the students study German.

Express the percentage of students studying Italian or Spanish as a percentage of those studying French or German.

.....%

**(Total for Question 20 is 4 marks)**

**6** Here are two special offers for buying dog food.

| **Special offer A** | **Special offer B** |
|---|---|
| Normally<br>$1.40 a tin<br><br>**Special offer**<br>Buy 1 tin, get 1 tin half price | Normally<br>pack of 6 tins for $7.20<br><br>**Special offer**<br>20% off each pack of 6 tins |

Gaspar buys 24 tins of dog food using special offer **A**.
Anna buys 24 tins of dog food using special offer **B**.

Work out the difference between the amount that Gaspar pays and the amount that Anna pays.

$.....

**(Total for Question 6 is 4 marks)**

**7** A circle has radius 6.5 cm.

Calculate the circumference of the circle.
Give your answer correct to 3 significant figures.

..... cm

**(Total for Question 7 is 2 marks)**

**19** Divya and Yuan each pay for a holiday at a special offer price.

| **Divya's holiday** | **Yuan's holiday** |
|---|---|
| Normal price: \$1600 | Normal price: \$1400 |
| Special offer:<br>16% off the normal price | Special offer:<br>$k$% off the normal price |

The amount that Divya pays is the same as the amount that Yuan pays.

Work out the value of $k$

$k$ = .....

**(Total for Question 19 is 4 marks)**

**6** Vivienne makes bread.

The weight of yeast she uses is 1% of the weight of flour she uses.

Vivienne uses 750 g of flour.

(a) Work out the weight of yeast she uses.

..... g

**(2)**

Bernard makes currant buns.

For every 400 g of flour he uses, he uses 125 g of currants.

Bernard uses 2000 g of flour.

(b) Work out the weight of currants he uses.

..... g

**(2)**

**(Total for Question 6 is 4 marks)**

**18** Nanette buys 60 notebooks for a total cost of 780 dirhams.

Nanette sells 70% of the notebooks for 22 dirhams each.
She sells the remaining notebooks for 19 dirhams each.

Work out Nanette's percentage profit.
Give your answer correct to 3 significant figures.

.....%

**(Total for Question 18 is 4 marks)**

**10** Haneul buys 120 packs of cherries.
Each pack of cherries that Haneul buys costs 28 Malaysian ringgits.

Haneul sells $\frac{4}{5}$ of the 120 packs of cherries.

He sells each of these packs for 46 Malaysian ringgits.

The remaining packs are unsold.

Work out Haneul's total profit.

..... Malaysian ringgits

**(Total for Question 10 is 4 marks)**

**17** Joshua buys a car for $12 500

He sells the car to Nina.

Nina pays

- a deposit of $1500
- followed by 36 monthly payments of $450

Work out Joshua's percentage profit.

.....%

**(Total for Question 17 is 4 marks)**

**20** Juan wants to buy a ticket to fly from Madrid to Berlin.

He finds two different types of ticket he can buy in a sale, ticket **A** and ticket **B**

| ticket **A** | ticket **B** |
|---|---|
| $\frac{1}{6}$ off normal price | 20% off normal price |

The sale price of ticket **A** is 140 euros.
The sale price of ticket **B** is 136 euros.

Work out the difference between the normal price of ticket **A** and the normal price of ticket **B**

..... euros

**(Total for Question 20 is 4 marks)**

**13** Bella buys 150 football shirts for a total cost of 1800 dollars.

She gives 10% of the shirts to the local football team.
Bella sells the rest of the shirts for $g$ dollars each.
She makes a total profit of 360 dollars.

Work out the value of $g$

$g$ = .....

**(Total for Question 13 is 4 marks)**

**16** Footballs are made in a factory.

On Monday, 375 footballs per hour were made in the factory.
On Monday, footballs were made in the factory for 8 hours.

On Tuesday, 20% more footballs were made than on Monday.
On Tuesday, 300 footballs per hour were made in the factory.

Work out for how many hours the factory made footballs on Tuesday.

..... hours

**(Total for Question 16 is 4 marks)**

**15** Rema buys 140 plants.

35% of the 140 plants cost \$6 each.

$\frac{1}{4}$ of the 140 plants cost \$8 each.

The rest of the 140 plants cost \$10 each.

Work out the total cost of the 140 plants.

\$.....

**(Total for Question 15 is 4 marks)**

**24** Shop **A** and Shop **B** have offers for buying the same type of laptop.

The normal price of the laptop in Shop **A** is different to the normal price of the laptop in Shop **B**

| **Shop A** | **Shop B** |
|---|---|
| Our normal price £475<br><br>Get 16% off our normal price | Get 15% off our normal price<br><br>Only pay £408 |

Which shop gives more money off their normal price?
Show your working clearly.

**(Total for Question 24 is 4 marks)**

**6** Here are the first four terms of a number sequence.

7 11 15 19

(a) Write down the next term of the sequence.

.....

**(1)**

(b) Explain how you found your answer to part (a)

.....

.....

**(1)**

(c) Find the 12th term of the sequence.

.....

**(1)**

**(Total for Question 6 is 3 marks)**

**7** The normal price of a calculator is £26.80

Amy gets $\frac{1}{4}$ off the normal price with her student discount card.

Amy buys 2 of these calculators.
She pays with a £50 note.

How much change should Amy receive?

£.....

**(Total for Question 7 is 4 marks)**

**6** The two-way table shows some information about where 50 people went for their last holiday.

| | **UK** | **Africa** | **USA** | Total |
|---|---|---|---|---|
| **Male** | | | 2 | 23 |
| **Female** | 16 | 9 | | |
| Total | | 16 | | 50 |

(a) Complete the table.

**(3)**

(b) What percentage of these 50 people were female **and** went on holiday in Africa?

..... %

**(2)**

**(Total for Question 6 is 5 marks)**

**7** 3 kg of potatoes and 2 kg of apples cost a total of £7.33
4 kg of potatoes cost £3.80

Work out the cost of 1 kg of apples.

£.....

**(Total for Question 7 is 4 marks)**

**4** (a) Write 0.4 as a percentage.

.....%

**(1)**

(b) What is 42 out of 80 as a percentage?

.....%

**(2)**

(c) Work out 72% of 350 cm.

.....cm

**(2)**

**(Total for Question 4 is 5 marks)**

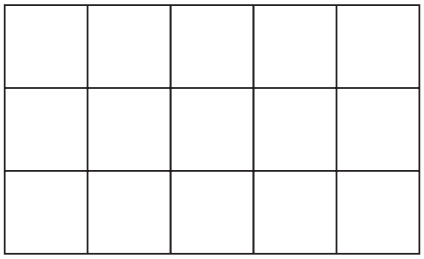
**5** (a) Which one of these fractions is equivalent to $\frac{4}{5}$ ?

$$\frac{20}{24} \quad \frac{8}{12} \quad \frac{1}{2} \quad \frac{16}{20} \quad \frac{6}{10}$$

.....

**(1)**

Here is a shape made of squares.



(b) Shade $\frac{4}{5}$ of the shape.

**(1)**

(c) Write $\frac{4}{5}$ as a percentage.

..... %

**(1)**

$\frac{4}{5}$ of a number is 48

(d) What is the number?

.....

**(2)**

**(Total for Question 5 is 5 marks)**

**12** Greg bought 36 oranges.
He paid 50p for each orange.

Greg sold $\frac{1}{2}$ of the oranges for 60p each.

He sold $\frac{1}{3}$ of the oranges for 40p each.

He sold the remainder of the oranges for 25p each.

Work out Greg's percentage loss.

.....%

**(Total for Question 12 is 5 marks)**

**13** (a) Express 180 as a percentage of 750

.....%

**(2)**

Zaina has booked a singer for a show.
The singer will get 94% of the total money from the ticket sales.

The cost of each ticket for the show is 32.50 dirhams.
Zaina sells 180 tickets.

(b) Work out the amount of money the singer will get.

..... dirhams

**(3)**

**(Total for Question 13 is 5 marks)**

**14** (a) Work out 39% of 450

.....

**(2)**

(b) Write one pair of brackets in this calculation so that the answer is correct.

$$9 \times 8 - 5 - 2 = 25$$

**(1)**

(c) Work out the value of $\dfrac{\sqrt{8.9}}{6.2 - 3.5}$

Give your answer as a decimal.
Write down all the figures on your calculator display.

.....

**(2)**

**(Total for Question 14 is 5 marks)**

**9** (a) Write $\frac{39}{150}$ as a percentage.

.....%

**(1)**

There are 30 dogs staying in some boarding kennels.
12 of the dogs are brown.

(b) What fraction of the dogs in the boarding kennels are **not** brown?
Give your fraction in its simplest form.

.....

**(2)**

(c) Show that $\frac{4}{9} + \frac{1}{6} = \frac{11}{18}$

**(2)**

**(Total for Question 9 is 5 marks)**

**10** A circle has a **diameter** of 14 cm.

Calculate the area of the circle.
Give your answer correct to 3 significant figures.

..... $cm^2$

**(Total for Question 10 is 2 marks)**

**19** Sarah makes and sells mugs.

One day she makes 150 mugs.
Her total cost for making these mugs is £1140

Of these mugs

$\frac{2}{5}$ are small mugs

32% are medium mugs

and the rest are large mugs

Here is Sarah's price list for selling each mug.

| MUGS | |
|---|---|
| **Small** | **£8.50** |
| **Medium** | **£11.20** |
| **Large** | **£14.20** |

Sarah sells all 150 mugs.

Work out her percentage profit.
Give your answer correct to the nearest whole number.

.....%

**(Total for Question 19 is 5 marks)**

**23** The table gives information about the average house price in England in 2018 and in 2019

| **Year** | **2017** | **2018** | **2019** |
|---|---|---|---|
| **Average house price (£)** | | 228 314 | 231 776 |

(a) Work out the percentage increase in the average house price from 2018 to 2019
Give your answer correct to one decimal place.

..... %

**(2)**

The average house price in 2019 was 7.7% greater than the average house price in 2017

(b) Work out the average house price in 2017
Give your answer correct to 3 significant figures.

£ .....

**(3)**

**(Total for Question 23 is 5 marks)**

**14** In 2001, the total number of cars produced in the world was 39.8 million.

In 2006, the total number of cars produced in the world was 10.1 million greater than the total number produced in 2001

(a) Express 10.1 million as a percentage of 39.8 million.
Give your answer correct to one decimal place.

..... %

**(2)**

In 2011, the total number of cars produced in the world was 59.9 million.

In 2016, the total number of cars produced in the world was 21% greater than the total number produced in 2011

In 2016, the total number of cars produced in the world was $N$ million.

(b) Work out the value of $N$.
Give your answer correct to the nearest whole number.

$N =$ .....

**(3)**

**(Total for Question 14 is 5 marks)**

**14** Chaviv makes 490 loaves of bread each week for his shop.

86 of the loaves are sourdough.

(a) Write 86 as a percentage of 490
Give your answer correct to one decimal place.

..... %

**(2)**

A loaf of sourdough bread weighs 375 grams before it is baked.

The loaf loses 12% of its weight when it is baked.

(b) Work out the weight of the loaf after it is baked.

..... grams

**(3)**

**(Total for Question 14 is 5 marks)**

**18** Norberto sells white loaves of bread and brown loaves of bread.

He sells a total of 200 loaves such that

the number of white loaves sold : the number of brown loaves sold = 3 : 2

Norberto sells the white loaves for £1.50 each.
He sells the brown loaves for £1.75 each.

40% of the price of a white loaf is profit.
60% of the price of a brown loaf is profit.

Work out Norberto's total profit when he sells all 200 loaves.

£.....

**(Total for Question 18 is 5 marks)**

**20** $N$ is a number.
17% of $N$ is 357

(a) Work out the value of $N$

$N =$ .....

**(2)**

In 2019, the population of a village was 650
In 2020, the population of the village was 806

(b) Work out the percentage increase in the population.

..... %

**(3)**

**(Total for Question 20 is 5 marks)**

**14** The table gives information about the price of gold.

| | 1st February 2016 | 1st March 2016 |
|---|---|---|
| **Price of one ounce of gold (dollars)** | 1126.50 | 1236.50 |

(a) Work out the percentage increase in the price of gold between 1st February 2016 and 1st March 2016
Give your answer correct to 3 significant figures.

%

**(3)**

The price of one ounce of gold on 1st February 2016 was 1126.50 dollars.
The price of gold increased by 19% from 1st February 2016 to 1st July 2016

(b) Work out the price of one ounce of gold on 1st July 2016
Give your answer correct to the nearest dollar.

dollars

**(3)**

**(Total for Question 14 is 6 marks)**

**19** Lorenzo increases all the prices on his restaurant menu by 8%

**Before** the increase, the price of a dessert was $4.25

(a) Work out the price of the dessert after the increase.

$ .....

**(3)**

**After** the increase, the price of lasagne is $9.45

(b) Work out the price of lasagne before the increase.

$ .....

**(3)**

**(Total for Question 19 is 6 marks)**

**21** In 2017, the population of a village was 7500
In 2019, the population of the village was 8265

(a) Work out the percentage increase in the population of the village from 2017 to 2019

.....%

**(3)**

In a sale, normal prices are reduced by 30%
The sale price of a T-shirt was 31.50 euros.

(b) Work out the normal price of the T-shirt.

..... euros

**(3)**

**(Total for Question 21 is 6 marks)**

**17** Gladys buys a table for $465 to sell in her shop.

She sells the table for $520

(a) Work out the percentage profit that Gladys makes from the sale of the table.
Give your answer correct to 3 significant figures.

.....%

**(3)**

Gladys has a sale in her shop.

She decreases all the normal prices by 12%
The normal price of an armchair was $550

(b) Work out the sale price of the armchair.

$.....

**(3)**

**(Total for Question 17 is 6 marks)**

**25** Chengbo sold a house for 180 000 yuan.

The amount for which he sold the house is 24% more than the amount he paid for the house.

(a) Work out how much Chengbo paid for the house.
Give your answer correct to 3 significant figures.

..... yuan
**(3)**

Zhi bought a house on 1st January 2017
When she bought the house, its value was 120 000 yuan.

The value of the house increased by 1.8% per year.

(b) Work out the value of Zhi's house on 1st January 2020
Give your answer correct to 3 significant figures.

..... yuan
**(3)**

**(Total for Question 25 is 6 marks)**

**TOTAL FOR PAPER IS 100 MARKS**

**10** (a) Write 25 as a fraction of 145
Give your fraction in its simplest form.

.....

**(2)**

(b) Work out 9 as a percentage of 25

.....%

**(2)**

The cost of 16 sandwiches of the same type is 28 euros.

(c) Work out the cost of 27 of these sandwiches.

..... euros

**(2)**

**(Total for Question 10 is 6 marks)**

**21** Asha bought an apartment.

The table gives information about the value of apartments, in euros, and the annual service charge band.

| Value ($x$ euros) | Service charge band |
|---|---|
| $x \geqslant 700\,000$ | A |
| $600\,000 \leqslant x < 700\,000$ | B |
| $500\,000 \leqslant x < 600\,000$ | C |
| $400\,000 \leqslant x < 500\,000$ | D |
| $0 < x < 400\,000$ | E |

In 2021, the value of Asha's apartment was 634 400 euros.

The value of Asha's apartment had increased by 4% from its value in 2020

(a) Has the annual service charge band changed for Asha's apartment?
Show your working clearly.

**(3)**

Pam bought a boat.

In each year after Pam bought the boat, the value of the boat depreciated by 15%

(b) Work out the total percentage by which the value of the boat had depreciated by the end of the second year after Pam bought the boat.

..... %

**(3)**

**(Total for Question 21 is 6 marks)**

**19** Anna makes cups.
Each cup costs 6 Swiss francs to make.

Anna puts the cups into boxes to sell.
Each box contains 4 cups.

Anna sells 80 boxes of cups for a total of 2160 Swiss francs.

(a) Work out the percentage profit Anna makes.
Show your working clearly.

.....%
**(4)**

The height of each cup is 9 cm, correct to the nearest cm

(b) Write down the lower bound of the height.

.....cm
**(1)**

The weight of each cup is 120 g, correct to the nearest 10 g

(c) Write down the upper bound of the weight.

.....g
**(1)**

**(Total for Question 19 is 6 marks)**

**27** A company makes cars.

In 2016, the company made 350 cars.

In the first 6 months of 2017, the company made 25 cars each month.
In the last 6 months of 2017, the company made 45 cars each month.

(a) Work out the percentage increase in the number of cars the company made from 2016 to 2017

..... %

**(4)**

The company's income in 2017 was $500 000 more than the company's income in 2016

The company's income in 2017 was 8% more than the company's income in 2016

(b) Work out the company's income in 2016

$.....

**(3)**

**(Total for Question 27 is 7 marks)**

**TOTAL FOR PAPER IS 100 MARKS**

**24** The table shows the cost, in euros, of Brigitte's car insurance in each of the years 2016, 2017 and 2018

| **Year** | **2016** | **2017** | **2018** |
|---|---|---|---|
| **Cost of insurance (euros)** | 500 | 545 | 592 |

Brigitte says,

"The percentage increase in the cost of my car insurance from 2017 to 2018 is more than the percentage increase in the cost of my car insurance from 2016 to 2017"

(a) Is Brigitte correct?
You must show how you get your answer.

**(4)**

Henri wants to insure his car.

He gets a discount of 15% off the normal price.
Henri pays 952 euros for his car insurance after the discount.

(b) Work out the discount that Henri gets.

..... euros

**(3)**

**(Total for Question 24 is 7 marks)**

**19** Mary saves for a holiday each year.

In 2020 she saved a total of $720
In 2021, each month she saved $78

The total amount Mary saved in 2021 was $P$% more than the total she saved in 2020

(a) Work out the value of $P$

.....

**(4)**

Roberto is going to go on holiday.

He has two coupons that will save him money on his holiday.

| **Coupon A** | **Coupon B** |
| --- | --- |
| 18% off the cost of the accommodation | 12.5% off the total cost of the accommodation **and** the flights |

For Roberto's holiday
the cost of the accommodation is $1600
the cost of the flights is $800

Roberto can only use one of the coupons.
He wants to save as much money as he can.

(b) Which of the two coupons, **A** or **B**, should he use?
Show your working clearly.

**(3)**

**(Total for Question 19 is 7 marks)**

**21** In his previous job, Pierre was paid 400 euros in total for working a 5-day week.

In his new job, Pierre is paid 14 euros per hour.
In his new job, Pierre works for 7 hours each day for a 5-day week.

(a) Work out the percentage increase in the amount that Pierre is paid for a 5-day week.

.....%

**(4)**

Marie changes her job.

Her salary decreases by 6%
Her new salary is 23 030 euros.

(b) Work out Marie's salary before she changes her job.

..... euros

**(3)**

**(Total for Question 21 is 7 marks)**

**16** Josh buys and sells books for a living.

He buys 120 books for £4 each.

He sells $\frac{1}{2}$ of the books for £5 each.

He sells 40% of the books for £7 each.
He sells the rest of the books for £8 each.

(a) Calculate Josh's percentage profit.

.....%

**(5)**

One book that Josh owns had a value of £15 on the 1st May 2019
The value of this book had increased by 20% in the last year.

(b) Find the value of the book on the 1st May 2018

£.....

**(3)**

**(Total for Question 16 is 8 marks)**

# MARK SCHEMES

official mark schemes, in the same order as the questions

**IGCSE Maths - Paper 1FR (1-9) 2018 June Mark scheme**

| **The correct answer, unless clearly, obtained by an incorrect method, should be taken to imply a correct method with the exception of Q24** | | | | | |
|---|---|---|---|---|---|
| **Question** | | **Working** | **Answer** | **Mark** | **Notes** |
| **1** | a | | African buffalo | 1 | B1 accept buffalo or 725 |
| | b | | 100 | 1 | B1 accept (one) hundreds |
| | c | | 1192 | 1 | B1 accept −1192 |
| | d | 800 × 20 ÷ 1000 | 16 | 2 | M1 ft for any number in the table<br>A1 |
| **2** | | 70 + 100 + 70 + 100 = 340<br>"340" × 3 | 1020 | 3 | M1 for working out the perimeter<br>M1 dep on first M mark<br>A1 |
| **3** | a | | $\frac{4}{15}$ | 1 | B1 Do not accept 4:15 but accept 4/15 |
| | b | | 4 squares shaded | 1 | B1 |
| **4** | a | | R marked | 1 | B1 |
| | b | | Trapezium | 1 | B1 |
| | c | | 65 | 1 | B1 accept answer in the range 63 – 67 |

| Question | | Working | Answer | Mark | Notes |
|---|---|---|---|---|---|
| **11** | a | | 101 | 1 | B1 |
| | b | $\sqrt{1025}-1$ | 32 | 2 | M1<br>A1 |
| **12** | | 180 − 124 = 56<br>56 ÷ 2 | 28 | 3 | M1<br>M1<br>A1 |
| **13** | | $\frac{21}{24}-\frac{4}{24}$ | Shown | 2 | M1 for 2 correct fractions with a common denominator<br>A1 for $\frac{17}{24}$ from correct working e.g. $\frac{34}{48}=\frac{17}{24}$ |
| **14** | a | 15 − 8×(−4) or 15 + 32 | 47 | 2 | M1<br>A1 |
| | b | 18 = 4p – 24 | 10.5 | 2 | M1<br>A1 oe<br>M1 $\frac{18}{4}=p-6$<br>A1 oe |
| **15** | | 240 m, 200 f<br>$\frac{65}{100}\times$ "240" (= 156) or $\frac{85}{100}\times$ "200" (= 170)<br>156 + 170 | 326 | 4 | B1 for 240 and 200<br>M1 as long as their numbers add up to 440<br>M1 (dep M1)<br>A1<br>SC:B2 for 334 |

| | | | | | |
|---|---|---|---|---|---|
| **15** | $\frac{2}{5}\times\frac{20}{11}$ or eg $\frac{8}{20}\div\frac{11}{20}$ | | 2 | M1 | For inverting $\frac{11}{20}$ and a clear intention to multiply or for writing both fractions correctly over the same common denominator |
| | $\frac{2}{5}\times\frac{20}{11}=\frac{40}{55}=\frac{8}{11}$ or<br>$\frac{2}{\cancel{5}^{1}}\times\frac{\cancel{20}^{4}}{11}=\frac{8}{11}$ or<br>$\frac{8}{20}\div\frac{11}{20}=\frac{8}{11}$ | Clearly shown | | A1 | dep on M1<br>continued to clearly show given result |
| | | | | | **Total 2 marks** |

| | | | | | | |
|---|---|---|---|---|---|---|
| **16** | a | | $50 < L \leq 60$ | 1 | B1 | oe eg 50 - 60 |
| | b | 25 × 6 + 35 × 26 + 45 × 31 + 55 × 40 + 65 × 17<br>(150 + 910 + 1395 + 2200 + 1105)(= 5760) | | | M2 | For correct products using midpoints (allow one error) with intention to add. M1 for products using frequency and a consistent value within the range (allow one error) with intention to add or correct products using midpoints (allow one error) without addition |
| | | "5760" ÷ "120" | | | M1 | dep on M1 |
| | | | 48 | 4 | A1 | |
| | | | | | | **Total 5 marks** |

| | | | | | |
|---|---|---|---|---|---|
| **11** | $\frac{10}{24}+\frac{9}{24}$ or $\frac{10n}{24n}+\frac{9n}{24n}$ or eg $\frac{40+36}{96}$ $\left(=\frac{76}{96}\right)$ | | 2 | M1 | for writing a sum, and each fraction with a common denominator, eg $\frac{10}{24}+\frac{9}{24}$ |
| | $\frac{10}{24}+\frac{9}{24}=\frac{19}{24}$ or eg $\frac{40+36}{96}=\frac{76}{96}=\frac{19}{24}$ | clearly shown | | A1 | dep on M1 continued to clearly show given result |
| | | | | | **Total 2 marks** |

| | | | | | | |
|---|---|---|---|---|---|---|
| **12** | (a) | | $4m + 8$ | 1 | B1 | do not isw further incorrect working |
| | (b) | $2x = -19 - 5$ **or** $2x = -24$ **or** $x=\frac{-19-5}{2}$ or $x=\frac{-24}{2}$ | | 2 | M1 | |
| | | | $-12$ | | A1 | cao |
| | | | | | | **Total 3 marks** |

| | | | | | | |
|---|---|---|---|---|---|---|
| **13** | (a) | | Correct mirror line $x = -1.5$ | 1 | B1 | Correct line drawn at $x = -1.5$ allow freehand with intention to draw at $-1.5$ |
| | (b) | | Shape drawn | 2 | B2<br>(B1 | for correct shape with vertices at $(-1,2)$, $(-1, 4)$, $(-3, 2)$ and $(-3, 5)$<br>for a correct orientation or 90° clockwise turn about correct point) |
| | | | | | | **Total 3 marks** |

| | | | | | |
|---|---|---|---|---|---|
| **16** | e.g. $\frac{20}{24}$ and $\frac{9}{24}$ **or** $\frac{40}{48}$ and $\frac{18}{48}$ **or** $\frac{20n}{24n}$ and $\frac{9n}{24n}$ | | 2 | M1 | for finding a common denominator with at least one fraction correct |
| | $\frac{20}{24}-\frac{9}{24}=\frac{11}{24}$<br>$\frac{40}{48}-\frac{18}{48}=\frac{22}{48}=\frac{11}{24}$<br>$\frac{20n}{24n}-\frac{9n}{24n}=\frac{11n}{24n}=\frac{11}{24}$ | Shown | | A1 | dep on M1, for a complete correct method leading to $\frac{11}{24}$ |
| | | | | | **Total 2 marks** |

| | | | | | |
|---|---|---|---|---|---|
| **17** | e.g. 0.7 × 20 160 oe (= 14 112)<br>**or** 0.3 × 20 160 oe (= 6048) | | 4 | M1 | |
| | e.g. "14 112" ÷ (9 + 5 + 2) (= 882)<br>**or** (20 160 − "6048") ÷ (9 + 5 + 2) (= 882) | | | M1 | M2 for $\frac{9-2}{9+5+2}\times$ "14 112" oe |
| | e.g. 9 × "882" – 2 × "882" | | | M1 | |
| | | 6174 | | A1 | |
| | | | | | **Total 4 marks** |

| | | | | | |
|---|---|---|---|---|---|
| **14** | | $F = 2r + 7h$ | 3 | B3 | for $F = 2r + 7h$ oe |
| | | | | (B2 | for $2r + 7h$ **or** $F = 2r + ah$ **or** $F = br + 7h$ **or** $F = 2h + 7r$) |
| | | | | (B1 | for $2r + ah$ **or** $br + 7h$ **or** $2h + 7r$ **or** $F = 2r$ **or** F = $7h$ **or** for $F$ = an incorrect expression in $r$ and $h$) |
| | *Correct answer scores full marks (unless from obvious incorrect working)* | | | | **Total 3 marks** |

| | | | | | |
|---|---|---|---|---|---|
| **15** | eg $\frac{21}{35}$ and $\frac{10}{35}$ **or** $\frac{21n}{35n}$ and $\frac{10n}{35n}$ | | 2 | M1 | for finding a common denominator with at least one fraction correct |
| | $\frac{21}{35}+\frac{10}{35}=\frac{31}{35}$<br>$\frac{21n}{35n}+\frac{10n}{35n}=\frac{31n}{35n}=\frac{31}{35}$ | Shown | | A1 | dep on M1, for a complete correct method leading to $\frac{31}{35}$ |
| | *Working required* | | | | **Total 2 marks** |

| | | | | | | |
|---|---|---|---|---|---|---|
| **12** | (a) | | 3 (hours)<br>25 (minutes) | 2 | B2<br><br>(B1 | for 3 (hours) **and** 25 (minutes)<br><br>for 3 (hours) **or** 25 (minutes)) |
| | (b) | 48 ÷ 120 (= 0.4) **or** 48 ÷ 120 × 100 oe<br>**or** $\frac{48}{120}$ oe eg $\frac{2}{5}$ **or** $\frac{48}{120}\times 100$ oe<br>**or** (120 – 48) ÷ 120 × 100 (= 60) oe | | 2 | M1 | for a correct first step |
| | | *Correct answer scores full marks (unless from obvious incorrect working)* | 40 | | A1 | cao |
| | | | | | | **Total 4 marks** |

| | | | | | |
|---|---|---|---|---|---|
| **13** | eg $\frac{12}{28}$ and $\frac{7}{28}$<br>**or** $\frac{12n}{28n}$ and $\frac{7n}{28n}$<br>**or** 4 × 3 (= 12) **and** (1 ×) 7 **and** 4 × 7 (= 28)<br>**or** $\frac{3\times 4}{4\times 7}$ and $\frac{(1\times)7}{4\times 7}$ | | 2 | M1 | for finding a common denominator with at least one fraction correct<br><br>**or**<br><br>for calculations that would lead to 12 **and** 7 **and** 28 |
| | $\frac{12}{28}+\frac{7}{28}=\frac{19}{28}$<br>**or** $\frac{12n}{28n}+\frac{7n}{28n}=\frac{19n}{28n}=\frac{19}{28}$<br>**or** 12 + 7 = 19 **and** $\frac{19}{28}$<br>**or** 4 × 3 + (1 ×) 7 (= 19) **and** 4 × 7 (= 28) **and** $\frac{19}{28}$<br>**or** $\frac{3\times 4+(1\times)7}{4\times 7}=\frac{19}{28}$<br>**or** $\frac{3\times 4}{4\times 7}+\frac{(1\times)7}{4\times 7}=\frac{19}{28}$<br>*Working required* | Shown | | A1 | dep on M1, for a complete correct method leading to $\frac{19}{28}$ |
| | | | | | **Total 2 marks** |

| Question | Working | Answer | Mark | Notes |
|---|---|---|---|---|
| **20** | $\frac{25}{7}$ and $\frac{13}{8}$ | | 3 | M1 correct improper fractions **or** two improper fractions with a common denominator, at least one correct |
| | eg $\frac{200}{56}-\frac{91}{56}$ *or* $\frac{8\times25}{56}-\frac{7\times13}{56}$ | | | M1 two correct fractions with a common denominator |
| | $\frac{109}{56}=1\frac{53}{56}$<br>Or $\frac{109}{56}$ with RHS shown as $\frac{109}{56}$ | correctly shown | | A1 dep on M2 with sight of the result of the subtraction eg $\frac{109}{56}$ and $1\frac{53}{56}$<br>but allow showing that $1\frac{53}{56}=\frac{109}{56}$ on RHS in working |
| | **Alternative method** | | | |
| | eg $(3)\frac{32}{56}-(1)\frac{35}{56}$ | | 3 | M1 two improper fractions with a common denominator, at least one correct |
| | $-\frac{3}{56}$ | | | M1 correct subtraction of fractional parts |
| | | correctly shown | | A1 dep on M2 with sight of the result of the subtraction eg $\frac{109}{56}$ or $2-\frac{3}{56}$ |
| | **Alternative method** | | | |
| | eg $3\frac{32}{56}-1\frac{35}{56}$ | | 3 | M1 two correct fractions with a common denominator, at least one correct |
| | eg $2\frac{88}{56}-1\frac{35}{56}$ | | | M1 complete correct method |
| | | correctly shown | | A1 dep on M2 |
| | | | | **Total 3 marks** |

| Question | Working | Answer | Mark | Notes |
|---|---|---|---|---|
| **15** | $45 \times 80 \times h$ or $3600h$ or $45 \times 80$ (= 3600) | | 4 | M1 |
| | $9 \times 1000 \times 20$ (= 180 000) | | | M1 |
| | "180 000" ÷ (45 × 80) | | | M1 |
| | | 50 | | A1 |
| **16** | $\frac{5}{3}+\frac{11}{4}$ | | 3 | M1 converts to improper fractions |
| | $\frac{20}{12}+\frac{33}{12}$ | | | M1 converts to fractions with the same common denominator |
| | $\frac{53}{12} = 4\frac{5}{12}$ | Shown | | A1 Dep on M2 |
| | **Alternative method** | | | |
| | $\frac{2}{3}+\frac{3}{4}=\frac{8}{12}+\frac{9}{12}$ | | | M1 correct method to add proper fractions |
| | $\frac{17}{12} = 1\frac{5}{12}$ | | | M1 |
| | $1\frac{5}{12} + 1 + 2 = 4\frac{5}{12}$ | Shown | | A1 Dep on M2 |

| | | | | | |
|---|---|---|---|---|---|
| **11** | (−1, −5)(0, −3)(1, −1)(2, 1)(3, 3)(4, 5)(5, 7) | Correct line between $x = -1$ and $x = 5$ | 3 | B3 | For a correct line between $x = -1$ and $x = 5$ |
| | | | | B2 | for a correct line through at least 3 of (−1, −5)(0, −3)(1, −1)(2, 1) (3, 3)(4, 5)(5, 7) **OR** for all of (−1, −5)(0, −3)(1, −1)(2, 1)(3, 3) (4, 5)(5, 7) plotted, not joined. |
| | | | | B1 | For at least 2 correct points stated (may be in a table) **OR** For a line drawn with a positive gradient through (0, −3) **OR** for a line with gradient of 2 |
| | | | | | **Total 3 marks** |

| | | | | |
|---|---|---|---|---|
| **12** | (**A** =) $\frac{1}{5} \times 75 (=15)$ oe **or** $\left(1-\frac{1}{5}\right) \times 75 (=60)$ oe | | 3 | M1 |
| | $\frac{75-"15"}{2} (=30)$ oe **or** $\frac{"75"-15-4}{2} (=28)$ oe **or** $\frac{"75"-15+4}{2} (=32)$ oe | | | M1 workings could be seen in an equation |
| | | 15, 32, 28 | | A1 |
| | | | | **Total 3 marks** |

| | | | | | |
|---|---|---|---|---|---|
| **13** | | $T = 2p + 3c$ | 3 | B3 | [award B2 if $T = 2p + 3c$ is incorrectly simplified] (condone $T = 2 \times p + 3 \times c$) |
| | | | | (B2) | for $T = 2p + kc$ **or** $T = kp + 3c$ ($k$ may be zero) **or** $2p + 3c$ |
| | | | | (B1) | for $2p$ **or** $3c$ **or** $T$ = a linear expression in $p$ and $c$ e.g. $T = p + c$ |
| | | | | | **Total 3 marks** |

| Question | | Working | Answer | Mark | Notes | |
|---|---|---|---|---|---|---|
| **17** | (a) | | $x > -3$ | 1 | B1 | Accept $-3 < x$ |
| | (b) | $4y - y \leq 8 + 13$ | $y \leq 7$ | 2 | M1<br>A1 | Arranging $y$'s on one side and the numbers on the other side.<br>(allow $4y - y = 8 + 13$ oe<br>or $4y - y < 8 + 13$ oe<br>or $4y - y > 8 + 13$ oe<br>or $4y - y \geq 8 + 13$ oe)<br>Allow $y \leq 21/3$ |
| | | | | | | **Total 3 marks** |

| | | | | | | |
|---|---|---|---|---|---|---|
| **18** | | $\frac{17}{3}(-)\frac{11}{4}$ oe or $5\frac{8}{12}(-)2\frac{9}{12}$<br>$\frac{68}{12} - \frac{33}{12}$ or $4\frac{20}{12} - 2\frac{9}{12}$<br>$\frac{35}{12} = 2\frac{11}{12}$ | | 3 | M1<br>M1 | Sight of $\frac{17}{3}$ and $\frac{11}{4}$ or $5\frac{8}{12}$ and $2\frac{9}{12}$<br>or $\frac{68n}{12n} - \frac{33n}{12n}$ |
| | | Alt:<br>$3 (+)(\frac{2}{3} - \frac{3}{4})$<br>$3 (+)(\frac{8}{12} - \frac{9}{12})$<br>$3 - \frac{1}{12} = 2\frac{11}{12}$ | | | A1<br>M1<br>M1 | Dep on M2 |
| | | Alt:<br>$4\frac{5}{3} - 2\frac{3}{4}$<br>$2 (+)(\frac{5}{3} - \frac{3}{4})$<br>$2 (+)(\frac{20}{12} - \frac{9}{12})$<br>$= 2\frac{11}{12}$ | | | A1<br>M1<br>M1<br>A1 | Dep on M2<br>Dep on M2 |

| | | | | |
|---|---|---|---|---|
| **14** | e.g. $36 \div (2 + 6)$ $(= 4.5)$ **or** $36 \div \frac{2+6}{3+2+6} (= 49.5)$ oe<br>**or** Asha = £9 **OR** Julie = £27 | | | M1 |
| | e.g. $3 \times$ "4.5" **or** "49.5" $\times \frac{3}{3+2+6}$ **or** "9" $\times \frac{3}{2}$ **or** "27" $\times \frac{3}{6}$ | | | M1 or an answer of $\frac{27}{2}$ |
| | | 13.5(0) | 3 | A1<br>SCB1 for $36/5 \times 6$ (=43.2) or $36/9 \times 2$ (=8) |
| | | | | **Total 3 marks** |

| | | | | | |
|---|---|---|---|---|---|
| **15** | e.g. $\frac{16}{5}$ **and** $\frac{21}{8}$ oe | | | M1 | both fractions expressed as improper fractions |
| | e.g. $\frac{\cancel{16}^{2}}{5} \times \frac{21}{\cancel{8}^{1}}$ **OR** $\frac{336}{40}$ oe | | | M1 | correct cancelling **OR** multiplication of numerators and denominators without cancelling |
| | e.g. $\frac{16}{5} \times \frac{21}{8} = \frac{336}{40} = \frac{42}{5} = 8\frac{2}{5}$<br>**or** $\frac{16}{5} \times \frac{21}{8} = \frac{336}{40} = 8\frac{16}{40} = 8\frac{2}{5}$<br>**or** $\frac{\cancel{16}^{2}}{5} \times \frac{21}{\cancel{8}^{1}} = \frac{42}{5} = 8\frac{2}{5}$<br>**or** candidate clearly shows that in the question, the result of $8\frac{2}{5} = \frac{42}{5}$ and that their answer becomes $\frac{42}{5}$ | shown | 3 | A1 | Dep on M2 for conclusion to $8\frac{2}{5}$ from correct working – either sight of the result of the multiplication e.g. $\frac{336}{40}$ must be seen or correct cancelling prior to the multiplication to $\frac{42}{5}$<br>NB: use of decimals scores no marks |
| | | | | | **Total 3 marks** |

| | | | | | |
|---|---|---|---|---|---|
| **19** | $\frac{14}{3}(+)\frac{19}{5}$ or $(4)\frac{10}{15}(+)(3)\frac{12}{15}$ or $(4)\frac{10a}{15a}(+)(3)\frac{12a}{15a}$ | | 3 | M1 | for correct improper fractions or fractional part of numbers written correctly over a common denominator |
| | eg $\frac{14\times5+19\times3}{3\times5}$ or $\frac{70}{15}+\frac{57}{15}$ or $\frac{70a}{15a}+\frac{57a}{15a}$ or $4\frac{10}{15}+3\frac{12}{15}=7\frac{22}{15}$ oe | | | M1 | for correct fractions with a common denominator of 15 or a multiple of 15 |
| | $\frac{70}{15}+\frac{57}{15}=\frac{127}{15}=8\frac{7}{15}$ or $7\frac{22}{15}=8\frac{7}{15}$<br>or if shows $8\frac{7}{15}=\frac{127}{15}$ at the beginning then show that the addition comes to $\frac{127}{15}$ | Shown | | A1 | dep on M2 for a correct answer from fully correct working **or** shows that RHS = $\frac{127}{15}$ **and** fully correct working shows LHS = $\frac{127}{15}$ |
| | | | | | ***Total 3 marks*** |

| | | | | | |
|---|---|---|---|---|---|
| **17** | e.g. $\frac{15}{4}$ | | 3 | M1 | for $3\frac{3}{4}$ expressed as an improper fraction |
| | e.g. $\frac{\cancel{15}^{5}}{4}\times\frac{7}{\cancel{9}^{3}}$ **OR** $\frac{105}{36}$ oe | | | M1 | correct cancelling or multiplication of numerators and denominators without cancelling |
| | e.g. $\frac{\cancel{15}^{5}}{4}\times\frac{7}{\cancel{9}^{3}}=\frac{35}{12}=2\frac{11}{12}$<br>**or** $\frac{15}{4}\times\frac{7}{9}=\frac{105}{36}=\frac{35}{12}=2\frac{11}{12}$<br>**or** $\frac{15}{4}\times\frac{7}{9}=\frac{105}{36}=2\frac{33}{36}=2\frac{11}{12}$ | shown | | A1 | dep on M2, for conclusion to $2\frac{11}{12}$ from correct working – either sight of the result of the multiplication e.g. $\frac{105}{36}$ oe must be seen<br>**or** correct cancelling prior to the multiplication to $\frac{35}{12}$<br>NB: use of decimals scores no marks |
| | | | | | **Total 3 marks** |

| | | | | | |
|---|---|---|---|---|---|
| **18** | | | 2 | M1 | Arcs on *BC*, *AB* and arcs from these points meeting **or** for bisector without arcs |
| | | Correct bisector | | A1 | must see correct arcs |
| | | | | | **Total 2 marks** |

| Question | Working | Answer | Mark | Notes |
|---|---|---|---|---|
| **16** | e.g. $\frac{16}{5}$ **and** $\frac{11}{6}$ or $\frac{96}{30}$ **and** $\frac{55}{30}$ | | 3 | M1 for two correct improper fractions |
| | e.g. $\frac{\cancel{16}^{8}}{5}\times\frac{11}{\cancel{6}^{3}}$ **or** $\frac{176}{30}$ **or** $\frac{5280}{900}$ oe | | | M1 correct cancelling or multiplication of numerators and denominators without cancelling |
| | e.g. $\frac{16}{5}\times\frac{11}{6}=\frac{176}{30}=\frac{88}{15}=5\frac{13}{15}$<br>**or** $\frac{16}{5}\times\frac{11}{6}=\frac{176}{30}=5\frac{26}{30}=5\frac{13}{15}$<br>**or** $\frac{\cancel{16}^{8}}{5}\times\frac{11}{\cancel{6}^{3}}=\frac{88}{15}=5\frac{13}{15}$<br>**or** $\frac{96}{30}\times\frac{55}{30}=\frac{5280}{900}=\frac{88}{15}=5\frac{13}{15}$<br>NB: a student can show initially that $5\frac{13}{15}=\frac{88}{15}$ and they need to show that LHS = $\frac{88}{15}$ | shown | | A1 Dep on M2 for conclusion to $5\frac{13}{15}$ from correct working – either sight of the result of the multiplication e.g. $\frac{176}{30}$ must be seen and equated to $\frac{88}{15}$ or $5\frac{26}{30}$<br>**or**<br>correct cancelling prior to the multiplication to $\frac{88}{15}$<br>NB: use of decimals scores no marks |
| | | | | **Total 3 marks** |

| | | | | | |
|---|---|---|---|---|---|
| **24** | | eg $\frac{4}{5}\times\frac{3}{7}(=\frac{12}{35})$oe **or** $0.24\times\frac{4}{7}(=\frac{96}{700})$oe **or**<br>eg $\frac{4}{5}\times 3(=\frac{12}{5}=2.4)$ **and** $0.24\times 4(=\frac{24}{25}=0.96)$ (or 3.36) **or**<br>eg $\frac{4}{5}\times 300(=240)$ **and** $0.24\times 400(=96)$ (or 336) | | 3 | M1 |
| | | eg "$\frac{12}{35}$"+"$\frac{96}{700}$" $\left(=\frac{336}{700}\right)$ oe **or**<br>$\frac{\text{"2.4"+"0.96"}}{3+4}\left(=\frac{3.36}{7}\right)$ oe **or**<br>eg $\frac{\text{"240"+"96"}}{300+400}\left(=\frac{336}{700}\right)$ oe | | | M1 or 0.48 or 48% or correct unsimplified fraction eg $\frac{84}{175}$ |
| | | | $\frac{12}{25}$ | | A1 cao |
| | | | | | **Total 3 marks** |

| | | | | | | |
|---|---|---|---|---|---|---|
| **10** | (a) | *For information*<br>$\frac{3}{8} = \frac{30}{80} = 0.375$ or 0.38 or 37[.5%] or 38[%]<br>$\frac{1}{4} = \frac{20}{80} = 0.25$ or 25[%]<br>$\frac{7}{20} = \frac{28}{80} = 0.35$ or 35[%]<br>$\frac{5}{16} = \frac{25}{80} = 0.31[25]$ or 31[.25%] | $\frac{1}{4}, \frac{5}{16}, \frac{7}{20}, \frac{3}{8}$ | 2 | B2 | can be given as fraction, decimal or percentage equivalents<br><br>B1<br>for 3 fractions oe in the correct order<br>**or** for 4 fractions oe in the correct reverse order<br>**or** for 2 fractions correctly converted to decimals or percentages<br>**or** 2 fractions written with a common denominator that is a multiple of 80 |
| | (b) | | $\frac{5}{14}$ | 1 | B1 | oe but must be fraction<br>Do not allow 5:14 or 5 out of 14 |
| | | | | | | **Total 3 marks** |

| Question | Working | Answer | Mark | Notes |
|---|---|---|---|---|
| **16** | eg $\frac{18}{7}$ **and** $\frac{9}{8}$ oe | | 3 | M1 both fractions expressed as improper fractions, no need for ÷ or × may be equivalent to those given eg $\frac{36}{14}$ or $\frac{27}{24}$ etc. A student could invert $\frac{9}{8}$ and go straight to the 2nd M1, this mark is then implied. |
| | eg $\frac{18}{7}\times\frac{8}{9}$ oe **or** $\frac{144}{56}\div\frac{63}{56}$ oe | | | M1 **or** for both fractions expressed as equivalent fractions with denominators that are a common multiple of 7 and 8 eg $\frac{144}{56}\div\frac{63}{56}$ |
| | eg $\frac{18}{7}\times\frac{8}{9}=\frac{144}{63}=\frac{16}{7}=2\frac{2}{7}$<br>**or** $\frac{18}{7}\times\frac{8}{9}=\frac{144}{63}=2\frac{18}{63}=2\frac{2}{7}$<br>**or** $\frac{\cancel{18}^{2}}{7}\times\frac{8}{\cancel{9}^{1}}=\frac{16}{7}=2\frac{2}{7}$<br>**or** $\frac{18}{7}\div\frac{9}{8}=\frac{144}{56}\div\frac{63}{56}=\frac{144}{63}=\frac{16}{7}=2\frac{2}{7}$<br>**or** correct working to $\frac{16}{7}$ **and** writing $2\frac{2}{7}=\frac{16}{7}$ | shown | | A1 Dep on M2 for conclusion to $2\frac{2}{7}$ from correct working – either sight of the result of the multiplication or division e.g. $\frac{144}{63}$ must be seen or correct cancelling prior to the multiplication to $\frac{16}{7}$<br>**or**<br>writing $2\frac{2}{7}=\frac{16}{7}$ (maybe on first line of working) and correct working as far as LHS = $\frac{16}{7}$<br>**NB: use of decimals scores no marks** |
| | | | | **Total 3 marks** |

| International GCSE Maths | | | | | |
|---|---|---|---|---|---|
| **Apart from questions 7, 8, 17, 22, 25 and 26 the correct answer, unless clearly obtained by an incorrect method, should be taken to imply a correct method** | | | | | |
| **Q** | **Working** | **Answer** | **Mark** | **Notes** | |
| **1** (a) | | one triangle fully shaded | 1 | B1 | or one quarter of the square shaded (ignoring diagonal lines). |
| (b) | | $\frac{3}{4}$ | 1 | B1 | oe |
| (c) | | $\frac{9}{10}$ | 1 | B1 | oe |
| | | | | | **Total 3 marks** |

| | | | | | | |
|---|---|---|---|---|---|---|
| **2** | (i) | | 8 | 1 | B1 | |
| | (ii) | | 14 | 1 | B1 | |
| | (iii) | | 30 | 1 | B1 | |
| | (iv) | | 3 or 23 | 1 | B1 | or both 3 and 23 |
| | (b) | 108 – 3 (= 105) or<br>$x \div 5$ where $x$ is found value from first stage<br>$(108-3) \div 5$ oe | | 2 | M1 | Allow 108 – 3 ÷ 5 or<br>– 3 ÷ 5 with the correct order indicated eg with arrows |
| | | | 21 | | A1 | cao<br>If no marks scored<br>SCB1 for 107.4 or 543 |
| | | | | | | **Total 6 marks** |

| | | | | | |
|---|---|---|---|---|---|
| **3** | (a)(i) | | unlikely | 1 | B1 |
| | (ii) | | evens | 1 | B1 |
| | (b) | | cross shown at 0 | 1 | B1 |
| | | | | | **Total 3 marks** |

| | | | | | | |
|---|---|---|---|---|---|---|
| **4** | (a) | | Qatar | 1 | B1 | |
| | (b) | | 9 | 1 | B1 | allow −9 |
| | (c) | | −4 | 1 | B1 | |
| | | | | | | **Total 3 marks** |

| | | | | | | |
|---|---|---|---|---|---|---|
| **5** | (a) | | Correct line | 1 | B1 | line drawn at $y = -2$ |
| | (b) | | (−1, 2) | 2 | B2 | for both coordinates correct<br>If not B2, then B1 for one correct coordinate or (2, –1) |
| | (c) | | ($d$ = ) 1 | 1 | B1 | accept (5, 1) |
| | | | | | | **Total 4 marks** |

| | | | | | | |
|---|---|---|---|---|---|---|
| **6** | (a) | | Trapezium | 1 | B1 | |
| | (b) | | F | 1 | B1 | |
| | (c) | | 4 | 1 | B1 | or "four" |
| | (d) | | 2 | 1 | B1 | or "two" |
| | | | | | | **Total 4 marks** |

| | | | | | | |
|---|---|---|---|---|---|---|
| **7** | $\frac{3}{8}\times\frac{5}{6}$ oe eg 0.375 ÷ 6 × 5<br>Allow 0.375 × 0.83…. oe | eg $\frac{3}{8}\times 48 = 18$ **and**<br>eg $\frac{5}{6}\times 18 = 15$ | | 3 | M1 | for showing intention to multiply the two given fractions **or** using a number of members that is a multiple of 48 to work out the number of right-handed children. |
| | eg $\frac{3}{8}\times\frac{5}{6}=\frac{15}{48}$ **or** $\frac{\cancel{3}^{1}}{8}\times\frac{5}{\cancel{6}_{2}}$<br>0.375 × 0.83…. = 0.31….. | $\frac{\text{"15"}}{\text{"48"}}$ | | | M1 | For an attempt to multiply fractions **or**<br>Dividing their 15 by their 48 |
| | | | $\frac{5}{16}$ | | A1 | dep on M1 |
| | | | | | | **Total 3 marks** |

| | | | | | |
|---|---|---|---|---|---|
| **17** | eg $\frac{27}{4}$ **and** $\frac{18}{7}$ | | 3 | M1 | Both fractions expressed as improper fractions. |
| | $\frac{27}{4}\times\frac{7}{18}$ oe<br>**or** eg $\frac{189}{28}\div\frac{72}{28}$ | | | M1 | for both fractions expressed as equivalent fractions with denominators that are a common multiple of 4 and 7<br>(seeing this stage gains M2) |
| | eg $\frac{27}{4}\times\frac{7}{18}=\frac{189}{72}=\frac{21}{8}=2\frac{5}{8}$<br>**or** $\frac{27}{4}\times\frac{7}{18}=\frac{189}{72}=2\frac{45}{72}=2\frac{5}{8}$<br>**or** $\frac{\cancel{27}^{3}}{4}\times\frac{7}{\cancel{18}_{2}}=\frac{21}{8}=2\frac{5}{8}$<br>**or** $\frac{189}{28}\div\frac{72}{28}=\frac{189}{72}=2\frac{45}{72}=2\frac{5}{8}$ oe<br>if the student clearly shows $2\frac{5}{8}=\frac{21}{8}$ then they only need to complete the LHS to $\frac{21}{8}$ (often done in 1st line of working) | shown | | A1 | dep M2 conclusion to $2\frac{5}{8}$ from correct working – either sight of the result of the multiplication e.g. $\frac{189}{72}$ must be seen then cancelled or correct cancelling prior to the multiplication with $\frac{21}{8}$ seen.<br>NB entire solution using decimals scores no marks. |
| | | | | | **Total 3 marks** |

| | | | | | | |
|---|---|---|---|---|---|---|
| **21** | (a) | | $3c^4+12c^3$ | 2 | B2 | for $3c^4+12c^3$<br>(B1 for $3c^4$ or $12c^3$) |
| | (b)(i) | | | 2 | M1 | for $(x\pm9)(x\pm1)$<br>**or** for $(x+a)(x+b)$ with $ab=-9$ or $a+b=8$ |
| | | | $(x+9)(x-1)$ | | A1 | for correct factors |
| | (ii) | | $-9$, 1 | 1 | B1 | ft dep on factorising in the form $(x+p)(x+q)$ |
| | | | | | | **Total 5 marks** |

| | | | | | |
|---|---|---|---|---|---|
| **22** | $\frac{8}{3}(+)\frac{15}{4}$ **or** $(2)\frac{8}{12}(+)(3)\frac{9}{12}$ **or** $(2)\frac{8a}{12a}(+)(3)\frac{9a}{12a}$ | | 3 | M1 | for correct improper fractions **or** fractional part of numbers written correctly over a common denominator |
| | eg $\frac{8\times4+15\times3}{3\times4}$ **or** $\frac{32}{12}+\frac{45}{12}$ **or** $\frac{32a}{12a}+\frac{45a}{12a}$<br>**or** $2\frac{8}{12}+3\frac{9}{12}=5\frac{17}{12}$ oe | | | M1 | for correct fractions with a common denominator of 12 or a multiple of 12 |
| | $\frac{32}{12}+\frac{45}{12}=\frac{77}{12}=6\frac{5}{12}$ **or** $5\frac{17}{12}=6\frac{5}{12}$<br>**or** if shows $6\frac{5}{12}=\frac{77}{12}$ at the beginning then show that the addition comes to $\frac{77}{12}$ | Shown | | A1 | dep on M2 for a correct answer from fully correct working **or** shows that RHS = $\frac{77}{12}$ **and** fully correct working shows LHS = $\frac{77}{12}$ |
| | | | | | **Total 3 marks** |

| | | | | | |
|---|---|---|---|---|---|
| 7 | $2 \times \pi \times 6.5$ or $\pi \times 13$ oe | | 2 | M1 | Allow use of $\pi$ as 3.14(2…) or $\frac{22}{7}$ |
| | | 40.8 | | A1 | 40.8 – 40.9 |
| | | | | | **Total 2 marks** |

| | | | | | |
|---|---|---|---|---|---|
| **8** | 200 – 37 – 25 – 42 (= 96) oe eg 200 – "104" (= 96) or $\frac{37+25+42}{200}\left(=\frac{104}{200}\right)$ | | 3 | M1 | |
| | $\frac{"96"}{200}$ **or** $"\frac{13}{25}"$ | | | M1ft | for a correct fraction, but not in lowest terms or for 0.48 or 48% or for cancelling their $\frac{104}{200}$ to simplest form (if their fraction cannot be cancelled then this mark is not awarded) |
| | | $\frac{12}{25}$ | | A1 | cao |
| | | | | | **Total 3 marks** |

| | | | | | |
|---|---|---|---|---|---|
| **20** | $\frac{16}{3}-\frac{20}{7}$ or $(5)\frac{7}{21}-(2)\frac{18}{21}$ or $(5)\frac{7a}{21a}-(2)\frac{18a}{21a}$ | | 3 | M1 | for correct improper fractions or fractional part of numbers written correctly over a common denominator |
| | $\frac{112}{21}-\frac{60}{21}$ or $\frac{112a}{21a}-\frac{60a}{21a}$ or $5\frac{7}{21}-2\frac{18}{21}=3-\frac{11}{21}$ oe or $5\frac{7}{21}-2\frac{18}{21}=4\frac{28}{21}-2\frac{18}{21}$ | | | M1 | for correct fractions with a common denominator with minus sign or mixed numbers to the stage shown |
| | $\frac{112}{21}-\frac{60}{21}=\frac{52}{21}=2\frac{10}{21}$ oe or $3-\frac{11}{21}=2\frac{10}{21}$ or $5\frac{7}{21}-2\frac{18}{21}=4\frac{28}{21}-2\frac{18}{21}=2\frac{10}{21}$ | Shown | | A1 | Dep on M2 for a correct answer from fully correct working<br><br>If all 3 fractions turned into improper fractions on the first line $\frac{16}{3}-\frac{20}{7}=\frac{52}{21}$ then the student **clearly** needs to show that the LHS = $\frac{52}{21}$ |
| | | | | | **Total 3 marks** |

| | | | | | |
|---|---|---|---|---|---|
| **16** | $\frac{26}{7}, \frac{13}{8}$ | | 3 | M1 | both fractions expressed as improper fractions, no need for ÷ or × may be equivalent to those given eg $\frac{52}{14}$ or $\frac{26}{16}$ etc.<br>A student could invert $\frac{13}{8}$ and show multiplication - as shown in the 2nd M1, this mark is then implied. |
| | $\frac{26}{7} \times \frac{8}{13}$ oe or eg $\frac{208}{56} \div \frac{91}{56}$ | | | M1 | **or** for both fractions expressed as equivalent fractions with denominators that are a common multiple of 7 and 8 eg $\frac{208}{56} \div \frac{91}{56}$ |
| | eg $\frac{26}{7} \times \frac{8}{13} = \frac{208}{91} = \frac{16}{7} = 2\frac{2}{7}$<br>**or** $\frac{26}{7} \times \frac{8}{13} = \frac{208}{91} = 2\frac{26}{91} = 2\frac{2}{7}$<br>**or** $\frac{\cancel{26}^{2}}{7} \times \frac{8}{\cancel{13}^{1}} = \frac{16}{7} = 2\frac{2}{7}$<br>**or** $\frac{26}{7} \div \frac{13}{8} = \frac{208}{56} \div \frac{91}{56} = \frac{208}{91} = \frac{16}{7} = 2\frac{2}{7}$<br>**or** correct working to $\frac{16}{7}$ **and** writing $2\frac{2}{7} = \frac{16}{7}$ *working required* | shown | | A1 | dep on M2<br>**NB: use of decimals scores no marks (unless used as a check)** |
| | | | | | **Total 3 marks** |

| | | | | | |
|---|---|---|---|---|---|
| **15** | eg $\frac{14}{3}$ **and** $\frac{11}{6}$ | | 3 | M1 | for both mixed numbers expressed as improper fractions |
| | eg $\frac{14}{3}\times\frac{6}{11}$ **or** $\frac{28}{6}\div\frac{11}{6}$ **or** $\frac{28n}{6n}\div\frac{11n}{6n}$ | | | M1 | seeing this stage gains M2 |
| | eg $\frac{14}{3}\times\frac{6}{11}=\frac{84}{33}=\frac{28}{11}=2\frac{6}{11}$<br>**or** $\frac{14}{3}\times\frac{6}{11}=\frac{84}{33}=2\frac{18}{33}=2\frac{6}{11}$<br>**or** $\frac{14}{\cancel{3}^{1}}\times\frac{\cancel{6}^{2}}{11}=\frac{28}{11}=2\frac{6}{11}$<br>**or** $\frac{14}{3}\div\frac{11}{6}=\frac{28}{6}\div\frac{11}{6}=\frac{28}{11}=2\frac{6}{11}$<br>**or** correct working to $\frac{28}{11}$ **and** writing $2\frac{6}{11}=\frac{28}{11}$<br>*Working required* | Shown | | A1 | dep on M2 for conclusion to $2\frac{6}{11}$<br>from correct working – either sight of result of multiplication eg $\frac{84}{33}$ must be seen or correct cancelling to $\frac{28}{11}$ or complete method using division and common denominators |
| | | | | | **Total 3 marks** |

| | | | | | | |
|---|---|---|---|---|---|---|
| **3** | (a) | | Pentagon | 1 | B1 | |
| | (b) | | 7.6 | 1 | B1 | accept 7.4 – 7.8 |
| | (c) | | *T* marked at interior angle *E* **or** exterior angle *C* | 1 | B1 | must be the interior angle at *E* or exterior angle at *C*. Allow both angles to be marked but no others. Allow *t* |
| | | | | | | **Total 3 marks** |

| | | | | | | |
|---|---|---|---|---|---|---|
| **4** | (a) | | 16 squares shaded | 1 | B1 | cao |
| | (b) | | 70 | 1 | B1 | cao |
| | (c) | | 0.049, 0.14, 0.4, 0.459, 0.49 | 1 | B1 | oe |
| | | | | | | **Total 3 marks** |

| | | | | |
|---|---|---|---|---|
| **8** | $26 \times 14$ (= 364) **or** $26 \times 15$ (= 390) **or** $14 \times 15$ (= 210) **or** $\frac{3}{4} \times 26 (=19.5)$ **or** $\frac{3}{4} \times 14 (=10.5)$ **or** $\frac{3}{4} \times 15 (=11.25)$ oe | | 3 | M1 For multiplying 2 of the 4 numbers 26, 14, 15, $\frac{3}{4}$ oe |
| | **3 of** 26, 14, 15, $\frac{3}{4}$ oe **seen** multiplied together | | | M1 For multiplying 3 of the 4 numbers (multiplication must be **seen**) – could be done in separate sums |
| | *Correct answer scores full marks (unless from obvious incorrect working)* | 4095 | | A1 |
| | | | | **Total 3 marks** |

| | | | | |
|---|---|---|---|---|
| **9** | | Correct triangle | 2 | B2 Correct triangle within tolerance<br>If not B2, then B1 for *CB* of length 6.5 cm or angle *ACB* = 38°<br>Allow *CB* length 6.3 cm to 6.7 cm and angle *ACB* = 36° to 40° |
| | | | | **Total 2 marks** |

| | | | | | |
|---|---|---|---|---|---|
| **17** | eg $\frac{14}{3}$ **and** $\frac{6}{5}$ | | 3 | M1 | both fractions expressed as improper fractions, no need for ÷ or × may be equivalent to those given eg $\frac{70}{15}$ or $\frac{18}{15}$ etc. A student could invert $\frac{6}{5}$ and go straight to the 2nd M1, this mark is then implied. |
| | $\frac{14}{3}\times\frac{5}{6}$ oe **or** $\frac{70}{15}\div\frac{18}{15}$ | | | M1 | For inverting 2nd fraction and showing intention to multiply **or** for both fractions expressed as correct equivalent fractions with the same denominator with intention to divide eg $\frac{70}{15}\div\frac{18}{15}$ |
| | eg $\frac{14}{3}\times\frac{5}{6}=\frac{70}{18}=\frac{35}{9}=3\frac{8}{9}$<br>**or** $\frac{14}{3}\times\frac{5}{6}=\frac{70}{18}=3\frac{16}{18}=3\frac{8}{9}$<br>**or** $\frac{\cancel{14}^{7}}{3}\times\frac{5}{\cancel{6}^{3}}=\frac{35}{9}=3\frac{8}{9}$<br>**or** $\frac{14}{3}\div\frac{6}{5}=\frac{70}{15}\div\frac{18}{15}=\frac{70}{18}=\frac{35}{9}=3\frac{8}{9}$<br>**or** correct working to $\frac{35}{9}$ **and** writing $3\frac{8}{9}=\frac{35}{9}$ (may be earlier in working)<br>*working required* | Shown | | A1 | Dep on M2 for conclusion to $3\frac{8}{9}$ from correct working – either sight of the result of the multiplication or division e.g. $\frac{70}{18}$ must be seen or correct cancelling prior to the multiplication to $\frac{35}{9}$<br>**OR**<br>writing $3\frac{8}{9}=\frac{35}{9}$ (maybe on first line of working) and correct working as far as LHS $=\frac{35}{9}$<br>**NB: marks are awarded for use of fractions not decimals (but allow a decimal check of answer)** |
| | | | | | **Total 3 marks** |

| Question | Working | Answer | Mark | Notes |
|---|---|---|---|---|
| **22** | eg $\frac{24}{7}$ **and** $\frac{8}{3}$ | | 3 | M1 for both mixed numbers expressed as improper fractions |
| | eg $\frac{24}{7}\times\frac{3}{8}$ **or** $\frac{72}{21}\div\frac{56}{21}$ **oe** | | | M1 (assumes previous M1) For inverting the 2nd fraction and showing intention to multiply or writing both fractions correctly over the same common denominator |
| | eg $\frac{24}{7}\times\frac{3}{8}=\frac{72}{56}=\frac{9}{7}=1\frac{2}{7}$<br>**or** $\frac{24}{7}\times\frac{3}{8}=\frac{72}{56}=1\frac{16}{56}=1\frac{2}{7}$<br>**or** $\frac{\cancel{24}^{3}}{7}\times\frac{3}{\cancel{8}^{1}}=\frac{9}{7}=1\frac{2}{7}$<br>**or** $\frac{24}{7}\div\frac{8}{3}=\frac{72}{21}\div\frac{56}{21}=\frac{72}{56}=\frac{9}{7}=1\frac{2}{7}$<br>**or** correct working to $\frac{9}{7}$ **and** writing $1\frac{2}{7}=\frac{9}{7}$ (possibly in first line of working) | Shown | | A1 dep on M2 for conclusion to $1\frac{2}{7}$ from correct working – either sight of result of multiplication eg $\frac{72}{56}$ must be seen or correct cancelling to $\frac{9}{7}$ or complete method using division and common denominators<br>Note: do not award the use of decimals any marks, but allow this as a check of work in fractions. |
| | | | | **Total 3 marks** |

| | | | | | |
|---|---|---|---|---|---|
| **19** | $\frac{7}{3}$ and $\frac{21}{4}$ | | 3 | M1 | may have $\frac{4}{21}$ rather than $\frac{21}{4}$ |
| | $\frac{7}{3}\times\frac{4}{21}$ oe eg $\frac{49}{21}\times\frac{4}{21}$<br>**or** $\frac{28}{12}\div\frac{63}{12}$ oe | | | M1 | for intention to multiply correct improper fraction and inverted fraction **or** writing the 2 fractions over the same common denominator |
| | eg $\frac{7}{3}\times\frac{4}{21}=\frac{28}{63}=\frac{4}{9}$ oe<br>eg $\frac{49}{21}\times\frac{4}{21}=\frac{196}{441}=\frac{4}{9}$<br>**or** $\frac{\cancel{7}^{1}}{3}\times\frac{4}{\cancel{21}^{3}}=\frac{4}{9}$ oe<br>**or** $\frac{28}{12}\div\frac{63}{12}=\frac{28}{63}=\frac{4}{9}$<br>*Working required* | Correctly shown | | A1 | for correctly completing to reach the required answer<br><br>Ignore any decimals used as checking. |
| | | | | | **Total 3 marks** |

| | | | | |
|---|---|---|---|---|
| **6** | 19 + 32 + 3 (= 54)<br>or 150 – 19 – 32 – 3 (= 96) | | 3 | M1 or $\frac{54}{150}$ |
| | $\frac{150-'54'}{150}$ $\left(=\frac{'96'}{150}\right)$<br>assumes previous M1 | | | M1 or any correct fraction not in simplest form or for $\frac{9}{25}$ |
| | *Correct answer scores full marks (unless from obvious incorrect working)* | $\frac{16}{25}$ | | A1 (SCB2 for 0.64 or 64% if no other marks scored, B1 for 0.36 or 36% if no other marks scored) |
| | | | | **Total 3 marks** |

| | | | | |
|---|---|---|---|---|
| **7** | 350 m*l* written as 0.35 (*l*) or<br>700 m*l* written as 0.7 (*l*) or<br>2.8 *l* written as 2800 (m*l*) | | 4 | B1 correct conversion (could be implied by further working) |
| | 2.8 – 2 × "0.35" (=2.1) or "2800" – 2 × 350 (=2100)<br>or<br>2 × 350 + 5*y* = 2800 oe or 2 × 0.35 + 5*y* = 2.8 oe | | | M1 Also award for $\frac{2.8-"0.35"}{5}$ or $\frac{2800-"350"}{5}$ |
| | $\frac{"2800"-"700"}{5}$ or $\frac{2.8-"0.7"}{5}$ or $\frac{"2.1"}{5}$ or $\frac{"2100"}{5}$ | | | M1 or for an answer of 0.42(0) |
| | *Correct answer scores full marks (unless from obvious incorrect working)* | 420 | | A1 |
| | | | | **Total 4 marks** |

| | | | | | |
|---|---|---|---|---|---|
| **20** | $\frac{18}{7}, \frac{28}{9}$ | | 3 | M1 | for correct improper fractions |
| | $\frac{\cancel{18}^{2}}{7^{1}} \times \frac{\cancel{28}^{4}}{\cancel{9}^{1}}$ or $\frac{18}{7} \times \frac{28}{9} = \frac{504}{63}$ oe eg $\frac{\cancel{18}^{2}}{7} \times \frac{28}{\cancel{9}^{1}} = \frac{56}{7}$<br>or $\left(\frac{18}{7} \times \frac{28}{9} =\right) \frac{162}{63} \times \frac{196}{63} = \frac{31752}{3969}$ | | | M1dep | for cancelling fractions fully<br>or<br>cancelling fractions partially and clear intention to multiply (allow arithmetic error in multiplication)<br>or<br>not cancelling and clear intention to multiply (allow arithmetic error in multiplication) |
| | eg $\frac{\cancel{18}^{2}}{7^{1}} \times \frac{\cancel{28}^{4}}{\cancel{9}^{1}} = 8$ or $\frac{\cancel{18}^{2}}{7^{1}} \times \frac{\cancel{28}^{4}}{\cancel{9}^{1}} = 2 \times 4 = 8$<br>eg $\frac{18}{7} \times \frac{28}{9} = \frac{504}{63} = 8$ oe or<br>eg $\left(\frac{18}{7} \times \frac{28}{9} =\right) \frac{162}{63} \times \frac{196}{63} = \frac{31752}{3969} \left(= \frac{8}{1}\right) = 8$<br>*working required* | Shown | | A1 | Dep on M2 for a correct answer from fully correct working<br>Candidates may show $8 = \frac{8}{1}$ (maybe under the given 8) and then they need only show the given fraction comes to $\frac{8}{1}$ |
| | | | | | **Total 3 marks** |

| | | | | | |
|---|---|---|---|---|---|
| **17** | $\frac{12}{7}(\times)\frac{35}{16}$ | | 3 | M1 | for both fractions written as improper fractions |
| | $\frac{12}{7}\times\frac{35}{16}=\frac{420}{112}$ oe eg $\frac{192}{112}\times\frac{245}{112}=\frac{47040}{12544}$ or $\frac{\cancel{12}^{3}}{\cancel{7}^{1}}\times\frac{\cancel{35}^{5}}{\cancel{16}^{4}}$ oe or eg $\frac{12}{\cancel{7}^{1}}\times\frac{\cancel{35}^{5}}{16}=\frac{60}{16}$ oe | | | M1 | for multiplying the numerators and denominators **or** cancelling the fractions fully **or** partial cancelling and multiplying numerators and denominators |
| | $\frac{12}{7}\times\frac{35}{16}=\frac{420}{112}=\frac{15}{4}=3\frac{3}{4}$ oe or<br><br>$\frac{12}{7}\times\frac{35}{16}=\frac{420}{112}=3\frac{84}{112}=3\frac{3}{4}$ oe<br><br>$\frac{\cancel{12}^{3}}{\cancel{7}^{1}}\times\frac{\cancel{35}^{5}}{\cancel{16}^{4}}=\frac{15}{4}=3\frac{3}{4}$ oe<br><br>*Working required* | shown | | A1 | completion to given result. dep on M2<br><br>If a student shows clearly in their working that $3\frac{3}{4}=\frac{15}{4}$ they only need to show that the LHS comes to $\frac{15}{4}$ |
| | | | | | **Total 3 marks** |

| | | | | |
|---|---|---|---|---|
| **18** | eg $\frac{9}{4}$ and $\frac{12}{7}$ | | 3 | M1 for $2\frac{1}{4}$ and $1\frac{5}{7}$ expressed as improper fractions |
| | eg $\frac{9}{\cancel{4}^{1}}\times\frac{\cancel{12}^{3}}{7}$ **OR** $\frac{9}{4}\times\frac{12}{7}=\frac{108}{28}$ oe eg $\frac{63}{28}\times\frac{48}{28}=\frac{3024}{784}$ | | | M1 correct cancelling or multiplication of numerators and denominators without cancelling |
| | eg $\frac{9}{\cancel{4}^{1}}\times\frac{\cancel{12}^{3}}{7}=\frac{27}{7}=3\frac{6}{7}$<br>**or** $\frac{9}{4}\times\frac{12}{7}=\frac{108}{28}=\frac{27}{7}=3\frac{6}{7}$<br>**or** $\frac{9}{4}\times\frac{12}{7}=\frac{108}{28}=3\frac{24}{28}=3\frac{6}{7}$<br>**or** $\frac{9}{4}\times\frac{12}{7}=\frac{63}{28}\times\frac{48}{28}=\frac{3024}{784}=\frac{27}{7}=3\frac{6}{7}$<br>**or** $\frac{9}{4}\times\frac{12}{7}=\frac{63}{28}\times\frac{48}{28}=\frac{3024}{784}=3\frac{672}{784}=3\frac{6}{7}$<br>**or** correct working to $\frac{27}{7}$ **and** writing $3\frac{6}{7}=\frac{27}{7}$<br>*Working required* | shown | | A1 dep on M2, for conclusion to $3\frac{6}{7}$ from correct working – either sight of the result of the multiplication e.g. $\frac{108}{28}$ oe must be seen **or** correct cancelling prior to the multiplication to $\frac{27}{7}$<br>NB: use of decimals scores no marks unless as a check |
| | | | | **Total 3 marks** |

| Question | | Working | Answer | Mark | Notes |
|---|---|---|---|---|---|
| **4*** | (a) | | 75.2 | 1 | B1 Allow $75\frac{1}{5}$ oe |
| | (b) |   | A clear indication of marking the first notch after 260 | 1 | B1 cao |
| | | | | | **Total 2 marks** |

| Question | | Working | Answer | Mark | Notes |
|---|---|---|---|---|---|
| **5** | (a) | | (–2, 3) | 1 | B1 |
| | (b) | | *T* clearly marked | 1 | B1 A point clearly marked at (3, –1) need not be labelled if meaning is clear |
| | (c) | | (2, 1) | 2 | B2 B1 for (2, *X*) or (*Y*, 1) or (1, 2) or the midpoint unambiguously marked in the correct place on the diagram |
| | | | | | **Total 4 marks** |

| Question | | Working | Answer | Mark | Notes |
|---|---|---|---|---|---|
| **6** | (a) | | $3\frac{4}{5}$ | 1 | B1 |
| | (b) | | $\frac{4}{5}, \frac{28}{35}$ | 1 | B1 Both fractions and no other fraction circled or clearly indicated in the list |
| | (c) | | $\frac{3}{10}$ | 1 | B1 oe fraction |
| | | | | | **Total 3 marks** |

| Question | Working | Answer | Mark | Notes |
|---|---|---|---|---|
| **20** | $\frac{22}{3}(-)\frac{25}{7}$ or<br>$(7)\frac{7}{21}(-)(3)\frac{12}{21}$ or<br>$(7)\frac{7a}{21a}(-)(3)\frac{12a}{21a}$ | | 3 | M1 for correct improper fractions or fractional part of numbers written correctly over a common denominator |
| | $\frac{154}{21}-\frac{75}{21}$ or $\frac{22\times7}{21}-\frac{25\times3}{21}$ or $\frac{22\times7-25\times3}{21}$<br>$\frac{154a}{21a}-\frac{75a}{21a}$ or<br>$7\frac{7}{21}-3\frac{12}{21}=4-\frac{5}{21}$ oe or<br>$7\frac{7}{21}-3\frac{12}{21}=6\frac{28}{21}-3\frac{12}{21}$ | | | M1 for correct fractions with a common denominator with minus sign or mixed numbers to the stage shown<br>$\frac{154}{21}-\frac{75}{21}$ or $\frac{22\times7}{21}-\frac{25\times3}{21}$ implies the first M1 |
| | $\frac{154}{21}-\frac{75}{21}=\frac{79}{21}=3\frac{16}{21}$ or<br>$4-\frac{5}{21}=3\frac{16}{21}$ or<br>$7\frac{7}{21}-3\frac{12}{21}=6\frac{28}{21}-3\frac{12}{21}=3\frac{16}{21}$<br>*Working required* | A fully correct solution shown | | A1 Dep on M2 for a correct answer from fully correct working<br>If a student shows that $3\frac{16}{21}=\frac{79}{21}$ then they must show correct working to $\frac{79}{21}$ and can gain full marks for this |
| | | | | **Total 3 marks** |

| Question | Working | Answer | Mark | Notes |
|---|---|---|---|---|
| 11 | $\frac{2}{7}\times 70$ (=20) **or** $\frac{1}{5}\times 70$ (=14) | | | M1 |
| | $\frac{2}{7}\times 70$ (=20) **and** $\frac{1}{5}\times 70$ (=14) **or** 34 | | | M1 |
| | $\frac{4}{9}\times(70-"34")$ (=16) | | | M1 |
| | | $\frac{16}{70}$ oe | 4 | A1 SC: if no marks awarded, award B2 for 65 |
| | **Alternative scheme** | | | |
| | $\frac{2}{7}+\frac{1}{5}$ oe $\left(=\frac{17}{35}\right)$ **or** 0.28(57…) + 0.2 (= 0.48(57…) | | | M1 may work in percentages |
| | $1-\frac{"17"}{35}$ oe $\left(=\frac{18}{35}\right)$ **or** 1 – "0.48" (=0.514…) | | | M1 may work in percentages |
| | $\frac{4}{9}\times"\frac{18}{35}"$ **or** $\frac{4}{9}\times"0.514"$ **or** $\frac{4}{9}\times"\frac{18}{35}"\times 70 (=16)$ | | | M1 may work in percentages |
| | | $\frac{16}{70}$ oe | | A1 SC: if no marks awarded, award B2 for 65 |

**Apart from questions 16, 21, 23 and 24 (b) (where the mark scheme states otherwise) the correct answer, unless clearly obtained from an incorrect method, should be taken to imply a correct method.**

| Question | | Working | Answer | Mark | Notes |
|---|---|---|---|---|---|
| **1** | (a) | | Manchester | 1 | B1 |
| | (b) | | 80 | 1 | B1 |
| | (c) | | 105 | 1 | B1 |
| **2** | (a) | | $\frac{1}{10}$ $\frac{1}{6}$ $\frac{1}{2}$ $\frac{3}{4}$ | 1 | B1 |
| | (b) | | 0.25 | 1 | B1 |
| | (c) | | 20 | 1 | B1 |
| | (d) | | $\frac{3}{8}$ | 1 | B1 accept 0.375 |
| **3** | (a) | | 3.5 | 1 | B1 3.3 - 3.7 |
| | (b) | | *Q* marked | 2 | B2 for a correct point<br>(B1 for angle or distance correct) |

| Question | Working | Answer | Mark | Notes |
|---|---|---|---|---|
| **17** | $\frac{3}{4}\times 60$ (= 45) **or** $\frac{1}{4}\times 60 (=15)$ **OR** $\frac{3}{4}\times\frac{3}{5}\left(=\frac{9}{20}\right)$<br><br>$\frac{3}{5}\times$"45" (= 27) **or** $\frac{4}{5}\times$"15" (= 12) **OR** $\frac{1}{4}\times\frac{4}{5}\left(=\frac{4}{20}\right)$<br><br>$\frac{\text{"27"+"12"}}{60}$ **OR** "$\frac{9}{20}$"+"$\frac{4}{20}$" | $\frac{13}{20}$ | 4 | M1<br><br>M1<br><br>M1 For a complete method<br><br>A1 oe |
| **18** | $14^2 - 10^2$ (= 96)<br><br>"96"+ $5^2$ (= 121)<br><br>$\sqrt{\text{"121"}}$ | 11 | 4 | M1<br><br>M1<br><br>M1<br><br>A1 |
| **19** | ($a$ = ) 40 − 14 (=26)<br><br>e.g. $\frac{\text{"26"}+b}{2}=30$ **or** 30 + (30 – "26") | 26<br>34 | 3 | M1 Method to find $a$<br><br>M1 Method to find $b$<br><br>A1 |

| | | | | | |
|---|---|---|---|---|---|
| **5** | | $\frac{3}{5}$ × (12481 – 8906) (=2145) **or** 1 – $\frac{3}{5}$(=$\frac{2}{5}$) **and** 12481 – 8906 (=3575) | | 4 | M2 If not M2 then award M1 for either 12481 – 8906 (=3575) **or** 1 – $\frac{3}{5}$(=$\frac{2}{5}$) |
| | | 3575 – "2145" **or** $\frac{2}{5}$ × "3575" | | | M1 dep |
| | | | 1430 | | A1 |
| | | | | | **Total 4 marks** |

| | | | | | |
|---|---|---|---|---|---|
| **6** | (a) | | 12*ef* | 1 | B1 |
| | (b) | | 3*m* + 8*k* | 2 | B2 B1 for 3*m* or (+) 8*k* |
| | (c) | 5*y* = 14 – 3 **or** 5*y* = 11 **or** 3 – 14 = –5*y* **or** –11 = – 5*y* | | 2 | M1 |
| | | | $2\frac{1}{5}$ | | A1 for $2\frac{1}{5}$ or $\frac{11}{5}$ oe or 2.2 |
| | | | | | **Total 5 marks** |

| | | | | | | |
|---|---|---|---|---|---|---|
| **5** | (a) | 4 – – 6 or – 6 – 4 or – 10 | | 2 | M1 | Identifying 4 and – 6 only.<br>or for stating 10 or – 10 |
| | | | 10 | | A1 | |
| | (b) | – 6, – 5, – 1, 3, 4<br>**or** 4, 3, – 1, – 5, – 6 | | 2 | M1 | Putting temperatures in ascending or descending order. |
| | | | – 1 | | A1 | |
| | (c) | $\frac{3}{5}\times 100$ oe | | 2 | M1 | accept $\frac{3}{5}$ or 0.6 oe |
| | | | 60 | | A1 | |
| | (d) | – 6 + 8 | | 2 | M1 | |
| | | | 2 | | A1 | Accept +2 |
| | | | | | | **Total 8 marks** |

| | | | | | |
|---|---|---|---|---|---|
| **6** | $\frac{4}{15}\times 1200\ (=320)$<br>**or** for $\frac{3}{15}$ or $\frac{8}{15}$ seen | | 4 | M1 | |
| | 1200 – "320" (= 880) **and** "880" ÷ 11 (=80)<br>**or** $\frac{3}{11}\times 880\quad (=240)$ oe<br>**or** $\frac{3}{15}\times 1200\quad (=240)$ oe | | | M1 | |
| | 1200 – ("320" + "240") **or** 880 – 240 (= 640)<br>**or** $\frac{8}{11}\times 880\quad (=640)$<br>**or** $\frac{8}{15}\times 1200$ oe | | | M1 | |
| | | 320, 240, 640 | | A1 | Must be on correct answer lines or clearly attributed to cake *A*, *B* and *C*, otherwise withhold final A mark. |
| | | | | | **Total 4 marks** |

| | | | | | | |
|---|---|---|---|---|---|---|
| **10** | (a) | eg $\frac{3}{10}\times\frac{4}{1}(=\frac{12}{10})$ or $\frac{6}{20}\div\frac{5}{20}$ or $\frac{12}{40}\div\frac{10}{40}$ | | 2 | M1 | Inverting $\frac{1}{4}$ and changing to multiply or writing both fractions with the same denominator. |
| | | eg $\frac{3}{10}\times\frac{4}{1}=\frac{12}{10}=\frac{6}{5}$<br>or $\frac{6}{20}\div\frac{5}{20}=\frac{6}{5}$<br>or eg $\frac{3}{\cancel{10}^{5}}\times\frac{\cancel{4}^{2}}{1}=\frac{6}{5}$ | shown | | A1 | Conclusion to $\frac{6}{5}$ from correct working – either sight of the result of the multiplication eg $\frac{12}{10}$ must be seen or correct cancelling prior to multiplication.<br>NB use of decimals scores no marks. |
| | (b) | eg $\frac{10}{12}-\frac{9}{12}$ or $\frac{20}{24}-\frac{18}{24}$ oe<br>**or** eg $\frac{10-9}{12}$ | | 2 | M1 | for correct fractions with a common denominator of 12 or a multiple of 12. |
| | | eg $\frac{10}{12}-\frac{9}{12}=\frac{1}{12}$ or $\frac{20}{24}-\frac{18}{24}=\frac{2}{24}=\frac{1}{12}$ oe | clearly shown | | A1 | dep on M1 for a correct answer from fully correct working. |
| | | | | | | **Total 4 marks** |

| | | | | | |
|---|---|---|---|---|---|
| **16** | (a) | eg $\frac{3}{8}\times\frac{32}{27}$ **or** $\frac{12}{32}\div\frac{27}{32}$ | | 2 | M1 Inverting $\frac{27}{32}$ and changing to multiply<br>**or** writing both factions with the same denominator. |
| | | eg $\frac{3}{8}\times\frac{32}{27}=\frac{96}{216}=\frac{4}{9}$<br>**or** $\frac{12}{32}\div\frac{27}{32}=\frac{12}{27}=\frac{4}{9}$<br>**or** eg $\frac{\cancel{3}^{1}}{\cancel{8}_{1}}\times\frac{\cancel{32}^{4}}{\cancel{27}_{9}}=\frac{4}{9}$ | Shown | | A1 Conclusion to $\frac{4}{9}$ - either sight of the result of the multiplication eg $\frac{96}{216}$ or $\frac{48}{108}$ or $\frac{24}{54}$ must be seen<br>**or** fully correct cancelling must be seen prior to multiplication<br>NB use of decimals scores no marks. |
| | (b) | eg $\frac{40}{48}-\frac{18}{48}$ or $\frac{20}{24}-\frac{9}{24}$ | | 2 | M1 for correct fractions with a common denominator of 24 or a multiple of 24 |
| | | eg $\frac{40}{48}-\frac{18}{48}=\frac{22}{48}=\frac{11}{24}$ or $\frac{20}{24}-\frac{9}{24}=\frac{11}{24}$ | Shown | | A1 dep M1 for a correct answer from fully correct working. |
| | | | | | **Total 4 marks** |

| | | | | | | |
|---|---|---|---|---|---|---|
| **4** | (a) | | $\frac{7}{10}$ | 1 | B1 | oe eg $\frac{70}{100}$ |
| | (b) | | 15 | 1 | B1 | |
| | (c) | eg $35 \times 3 \div 5$ **or** $7 \times 3$ **or** $\frac{3}{5} \times 35$ | | 2 | M1 | for a complete method |
| | | | 21 | | A1 | |
| | | | | | | **Total 4 marks** |

| | | | | | | |
|---|---|---|---|---|---|---|
| **5** | (a) | | 1 | 1 | B1 | or one line (only) on the diagram clearly indicated |
| | (b) | | 2 | 1 | B1 | |
| | (c) | | 126 | 1 | B1 | allow $\pm 2$ |
| | | | | | | **Total 3 marks** |

| | | | | | | |
|---|---|---|---|---|---|---|
| **6** | (a) (i) | | 27 | 1 | B1 | |
| | (ii) | | 5, 16 | 1 | B1 | either or both indicated |
| | (b) | 5 or 23 identified as a prime **or** 5 + 23 | | 2 | M1 | at least one prime identified |
| | | | 28 | | A1 | |
| | | | | | | **Total 4 marks** |

| | | | | | | |
|---|---|---|---|---|---|---|
| **7** | (a) | | (−1, 3) | 1 | B1 | |
| | (b) | | (5, 1) | 2 | B1<br>B1 | for $x = 5$<br>for $y = 1$ |
| | (c) | $\frac{1}{2} \times 6 \times 4$ oe | | 2 | M1 | for a correct method |
| | | | 12 | | A1 | |
| | (d) | | *D* indicated at (−1, −1) | 1 | B1 | label not required if coordinate clearly indicated |
| | | | | | | **Total 5 marks** |

| | | | | | |
|---|---|---|---|---|---|
| **11** | (a) | | 169 | 1 | B1 |
| | (b) | | 3 | 1 | B1 |
| | (c) | | 1.45582(0007) | 2 | B2 (B1 for 5.590… or 3.84 or 1.45, 1.46, 1.455, 1.456, 1.4558) |
| | | | | | **Total 4 marks** |

| | | | | | |
|---|---|---|---|---|---|
| **12** | $\frac{39}{n}$ where $n = 3$, 4 or 7 or "(7 – 4)" or for 13 or 9.75 or 5.57… or<br>4 : 7<br>8 : 14<br>12 : 21<br>16 : 28<br>20 : 35 etc to 32 : 56 or more (don't have to include all trials: ratios must be correct) | | 3 | M1 | or allow for this mark eg $\frac{39\times4}{7}(=\frac{156}{7}=22.8)$ or $\frac{39\times7}{4}(=\frac{273}{4}=68.25)$ |
| | $\frac{39}{7-4}\times4$ oe eg $\frac{4}{3}\times39$ or for 52 : 91 | | | M1 | working with figures obtained from a correct method |
| | *Correct answer scores full marks (unless from obvious incorrect working)* | 52 | | A1 | (52 : 91 or 91 is M2 unless Alisha = 52 clearly shown in working) |
| | | | | | **Total 3 marks** |

| | | | | | |
|---|---|---|---|---|---|
| **13** | eg $\frac{380+20}{2}(=200)$ or $\frac{380-20}{2}(=180)$ or $\frac{380}{2}+10\,(=200)$ or $\frac{380}{2}-10(=180)$ | | 4 | M1 | For a correct method to find the number of students in the U6 or the L6 |
| | $\frac{2}{5}\times n$ oe **or (**U6 Maths **=)** 72<br>**or**<br>$0.32\times m$ oe **or** (L6 Maths = ) 64<br><br>[where $n$ and $m$ are positive numbers] | | | M1 | |
| | $\frac{2}{5}\times n$ + $0.32\times m$<br>**or**<br>72 + 64 | | | M1 | |
| | *Correct answer scores full marks (unless from obvious incorrect working)* | 136 | | A1 | cao |
| | | | | | **Total 4 marks** |

| | | | | | |
|---|---|---|---|---|---|
| **10** (a) | eg 500 × 1.18 | | 2 | M1 | |
| | *Correct answer scores full marks (unless from obvious incorrect working)* | 590 | | A1 | |
| (b) | eg 350 ÷ 1.40 | | 2 | M1 | |
| | *Correct answer scores full marks (unless from obvious incorrect working)* | 250 | | A1 | |
| | | | | **Total 4 marks** | |

| | | | | | |
|---|---|---|---|---|---|
| **11** | eg $\frac{1}{4}\times 200\ (=50)$ **or** $\frac{2}{5}\times 200\ (=80)$ **OR** $\frac{43}{200}$ | | 4 | M1 | for a method to find the beads for Bernadette **or** Claudio **OR** Derek's beads as a fraction |
| | eg $\frac{1}{4}\times 200\ (=50)$ **and** $\frac{2}{5}\times 200\ (=80)$ **OR** $\frac{43}{200}+\frac{1}{4}+\frac{2}{5}\left(=\frac{173}{200}\right)$ | | | M1 | for a method to find the beads for Bernadette **and** Claudio **OR** method to find the fraction of the 200 beads given away |
| | eg 200 – "50" – "80" – 43 (= 27) **OR** $1-"\frac{173}{200}"$ | | | M1 | for a method to find the number of beads Asif has left **OR** 1 − the fraction of the 200 beads given away |
| | *Correct answer scores full marks (unless from obvious incorrect working)* | $\frac{27}{200}$ | | A1 | cao |
| | | | | **Total 4 marks** | |

**International GCSE Maths**

**Apart from questions 23 and 24 the correct answer, unless clearly obtained by an incorrect method, should be taken to imply a correct method**

| Q | | Working | Answer | Mark | Notes |
|---|---|---|---|---|---|
| 1 | (a) | | 12 of the 15 squares shaded | 1 | B1 cao |
| | (b) | | $\frac{3}{4}$ | 1 | B1 cao |
| | (c) | | 0.03 | 1 | B1 cao |
| | (d) | | 14 | 1 | B1 cao |
| | | | | | **Total 4 marks** |

| | | | | | |
|---|---|---|---|---|---|
| 2 | (a) | | Mandarin Chinese | 1 | B1 allow 918 000 000, Mandarin, Chinese |
| | (b) | | 115 | 1 | B1 cao |
| | (c) | | 300 | 1 | B1 cao |
| | (d) | | Eight hundred and sixty one thousand, seven hundred | 1 | B1 |
| | | | | | **Total 4 marks** |

| | | | | | |
|---|---|---|---|---|---|
| **4** | (a) | | (1, 6) | 1 | B1 |
| | (b) | | (−3, −1) | 1 | B1 |
| | (c) | | Cross at (1, 2) | 1 | B1 |
| | (d) | | Cross at (5, −1) | 1 | B1 |
| | (e) | | 1 | 1 | B1 cao |
| | | | | | **Total 5 marks** |

| | | | | | |
|---|---|---|---|---|---|
| **5** | (a) | | 8 squares shaded | 1 | B1 |
| | (b) | | 30 | 1 | B1 |
| | (c) | | $\frac{8}{25}$ | 1 | B1 |
| | (d) | | $6\frac{4}{7}$ | 1 | B1 |
| | | | | | **Total 4 marks** |

**International GCSE Maths**

Apart from questions 11, 16c (where the mark scheme states otherwise) the correct answer, unless obtained from an incorrect method, should be taken to imply a correct method.

| Question | Working | Answer | Mark | Notes |
|---|---|---|---|---|
| **1** a | | 0.07 | 1 | B1 cao |
| b | | $\frac{4}{5}$ | 1 | B1 cao |
| c | | $5\frac{2}{3}$ | 1 | B1 cao |
| d | 840 ÷ 7 (=120) oe **or** $\frac{6}{7}\times 840$ oe **or** 0.14(2…) × 840 (=120) oe **or** 117.6 | 720 | 2 | M1<br>A1 cao |

| | | | | | |
|---|---|---|---|---|---|
| **5** | | | CO, CM, CW, EO, EM, EW, TO, TM, TW | 2 | B2 for all combinations with no repeats or incorrect combinations<br><br>If not B2 then award B1 for at least 4 correct combinations (ignore repeats or incorrect combinations) |
| | | | | | **Total 2 marks** |

| | | | | | |
|---|---|---|---|---|---|
| **6** | (a) | | 0.25 | 1 | B1 |
| | (b) | $3\frac{4}{10}$ **or** $\frac{17}{5}$ | | 2 | M1 for converting to a simplified improper fraction **or** an unsimplified mixed fraction |
| | | | $3\frac{2}{5}$ | | A1 |
| | (c) | $\frac{3}{4}\times\frac{16}{15}$ **or** E.g. $\frac{12}{16}\div\frac{15}{16}$ | | 2 | M1 |
| | | E.g.<br>$\frac{3}{4}\times\frac{16}{15}=\frac{48}{60}=\frac{4}{5}$ **or**<br>$\frac{12}{16}\div\frac{15}{16}=\frac{12}{15}=\frac{4}{5}$ **or** | Shown | | A1 for fully correct method leading to $\frac{4}{5}$ - this must be preceded by a correct equivalent fraction e.g. $\frac{48}{60}$ , $\frac{12}{15}$ , $\frac{16}{20}$ **or** fully correct cancelling must be seen within a multiplication |
| | | | | | **Total 5 marks** |

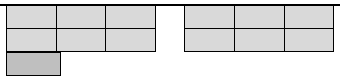
| Question | | Working | Answer | Mark | Notes |
|---|---|---|---|---|---|
| 4 | (a) | | $\frac{11}{15}$ | 1 | B1oe |
| | (b) | | $4\frac{3}{5}$ | 1 | B1oe eg $4\frac{6}{10}$ |
| | (c) | | $\frac{23}{100}$ | 1 | B1oe eg $\frac{46}{200}$ |
| | (d) | | 0.4 | 1 | B1 Accept 0.40 |
| | (e) | | 3.555, 3.61, 3.7, 3.82, 3.9 | 1 | B1 |
| | | | | | **Total 5 marks** |

| | | | | |
|---|---|---|---|---|
| **5** | (*BC* =) 96 – 30 (=66) | | 3 | M1 |
| | 96 + (66 ÷ 3) oe | | | M1 |
| | | 118 | | A1 |
| | | | | **Total 3 marks** |

| | | | | |
|---|---|---|---|---|
| **6** | | 9 hours 45 mins | 2 | B2 B1 for 9 hours or 45 minutes |
| | | | | **Total 2 marks** |

| | | | | | |
|---|---|---|---|---|---|
| **7** | (a) | | (2, 3) | 1 | B1 |
| | (b) | | (−3, −1) | 1 | B1 |
| | (c) | | (−0.5, 1) | 2 | B2 B1 for (−0.5, *y*) or (*x*, 1) or (1, −0.5) |
| | | | | | **Total 4 marks** |

| International GCSE Maths A June 2020 – Paper 1FR Mark scheme | | | | | |
|---|---|---|---|---|---|
| **Apart from Questions 10, 13, 16b, 17, 19c, where the mark scheme states otherwise, the correct answer, unless clearly obtained by an incorrect method, should be taken to imply a correct method.** | | | | | |
| **Q** | | **Working** | **Answer** | **Mark** | **Notes** |
| **1** | (a) | | 3 squares shaded | 1 | B1 |
| | (b) | | $3\frac{4}{5}$ | 1 | B1 oe for an equivalent mixed number |
| | (c) | | $\frac{4}{11}$ | 1 | B1 oe |
| | (d) | | $\frac{14}{18}$ | 1 | B1 for any fraction equivalent to $\frac{7}{9}$ |
| | (e) | | $\frac{3}{100}$ | 1 | B1 oe |
| | | | | | **Total 5 marks** |

| | | | | | |
|---|---|---|---|---|---|
| **2** | (a) | | 40 | 1 | B1 |
| | (b) | e.g. 9 × 4 or 68 – 32 oe | | 2 | M1 May be seen by side of pictogram. |
| | | | 36 | | A1 |
| | (c) |  | 2 rectangles of 6 sections and 1 small section | 1 | B1 oe |
| | | | | | **Total 4 marks** |

| | | | | | | |
|---|---|---|---|---|---|---|
| **3** | (a) | | 14 | 1 | B1 | |
| | (b) | | −19 | 1 | B1 | |
| | | | | | | **Total 2 marks** |

| | | | | | | |
|---|---|---|---|---|---|---|
| **4** | (a) | 0.3 × 30 (= 9) **or** $\frac{1}{3}\times 30(=10)$ **or** $\frac{1}{3}+\frac{30}{100}\left(=\frac{19}{30}\right)$oe **or** 0.333…+ 0.3(=0.63…) **or** 33.3…(%) + 30(%)oe (=63.3…)(%) | | 3 | M1 | Allow 9 squares clearly indicated for 30% or 10 squares clearly indicated for $\frac{1}{3}$ |
| | | "9" and "10" or 19 shaded squares on diagram **or** $\left(1-"\frac{19}{30}"\right)\times 30$ **or** (1 – 0.63…)× 30 | | | M1 | Allow squares with crosses or other indication of 'shading' such as '*y*' or '*b*' |
| | | | 11 | | A1 | |
| | (b) | eg 76% (25%) 7.66% (8%) 2.6% or (0.76) 0.25 (0.0766) 0.08 (0.026) | | 2 | M1 | All values written as % or all written as decimals or 4 values in correct order or all values in correct reverse order |
| | | | 0.026, 0.0766, 8%, 25%, 0.76 | | A1 | Any form |
| | | | | | | **Total 5 marks** |

**International GCSE Maths**

Apart from question 15b (where the mark scheme states otherwise) the correct answer, unless clearly obtained from an incorrect method, should be taken to imply a correct method.

| Question | | Working | Answer | Mark | Notes |
|---|---|---|---|---|---|
| **1** | (a) | | 8543 | 1 | B1 |
| | (b) | | 4 digits ending in 5 | 1 | B1 e.g. 3845, 8345 etc |
| | (c) | | 3485 | 1 | B1 |
| | | | | | **Total 3 marks** |

| | | | | | |
|---|---|---|---|---|---|
| **2** | (a) | | 0.8 | 1 | B1 |
| | (b) | | $8\frac{5}{9}$ | 1 | B1 |
| | (c) | | $\frac{7}{9}$ | 1 | B1 |
| | (d) | | 4.013, 4.02, 4.807, 4.81, 4.85 | 1 | B1 |
| | (e) | 0.65 + 0.72 or $\frac{65}{100}+\frac{72}{100}$ or $\frac{13}{20}+0.72$ oe | 1.37 | 2 | M1 A1 or $\frac{137}{100}$ |
| | | | | | **Total 6 marks** |

| Question | | Working | Answer | Mark | Notes |
|---|---|---|---|---|---|
| 3 | (a) | | 9 squares shaded | 1 | B1 |
| | (b) | | $7\frac{2}{3}$ | 1 | B1 |
| | (c) | 60 ÷ 5 or 12 or 2 × 60 or 120 | | 2 | M1 |
| | | | 24 | | A1 |
| | (d) | $\frac{1}{4}=\frac{4}{16}$ *and* $\frac{1}{8}=\frac{2}{16}$ oe or<br>$\frac{1}{4}=\frac{6}{24}$ *and* $\frac{1}{8}=\frac{3}{24}$ *and* $\frac{1}{6}=\frac{4}{24}$ oe | | 2 | M1 or use of decimals for 0.25 and 0.125 |
| | | | Correct conclusion based on correct figures | | A1 e.g. $\frac{3}{16}$ is halfway between $\frac{1}{4}$ *and* $\frac{1}{8}$ ($\frac{3}{16}\neq\frac{1}{6}$) oe or using second method above, 4 is not halfway between 3 and 6 or 0.1875, 0.16666… and No |
| 4 | (a) | | 22 | 1 | B1 |
| | (b) | | 10 | 1 | B1 |
| | (c) | | Correctly completed pictogram | 1 | B1 2½ circles oe |
| 5 | (a) | | −6, −5, −4, 8 10 | 1 | B1 |
| | (b) | | 15 | 1 | B1 Allow −15 |
| | (c) | | 1 | 1 | B1 |
| | (d) | | −14 | 1 | B1 |

| Question | Working | Answer | Mark | Notes |
|---|---|---|---|---|
| **14** (a) | $\frac{40}{750}$ oe | | 2 | M1 Numerator and denominator must be integers. |
| | | $\frac{4}{75}$ | | A1 |
| (b) | $\frac{40}{100} \times 6.8$ oe | | 2 | M1 |
| | | 2.72 | | A1 |
| (c) | $\frac{3}{40} \times 100$ oe | | 2 | M1 |
| | | 7.5 | | A1 |
| | | | | **Total 6 marks** |

| | | | | |
|---|---|---|---|---|
| **15** | $\angle ABC = 360° - 298° (= 62°)$ or $\angle BCA = 97°$ | | 4 | M1 Could be marked on diagram |
| | | 21 | | A1 |
| | vertically opposite, (are equal)<br>angles at (around) a point, (= 360°)<br>angles in a triangle (= 180°) | | | B2 B2 for 3 correct reasons which must include the underlined words<br>B1 for 1 or 2 correct reasons which must include the underlined words<br>Any B marks dep on M1 |
| | | | | **Total 4 marks** |

| | | | | |
|---|---|---|---|---|
| **16** | 10 × 5 + 30 × 11 + 50 × 8 + 70 × 19 + 90 × 9<br>(50 + 330 + 400 + 1330 + 810) | | 3 | M2 Correct products using midpoints (allowing one error) with intention to add.<br>M1 for products using frequency and a consistent value within the range (allowing one error) with intention to add.<br>or correct products using midpoint without intention to add. |
| | | 2920 | | A1 N.B. 2920 ÷ 52(=56.15...) gains M2 only |
| | | | | **Total 3 marks** |

| | | | | | | |
|---|---|---|---|---|---|---|
| **6** | a | | 6 squares shaded | 1 | B1 | |
| | b | | $\frac{3}{10}$ | 1 | B1 | |
| | c | $\frac{1}{2} = \frac{30}{60} = 0.5$ or 50% $\frac{3}{4} = \frac{45}{60} = 0.75$ or 75%<br>$\frac{4}{5} = \frac{48}{60} = 0.8$ or 80%<br>$\frac{5}{6} = \frac{50}{60} = 0.83...$ or 83...% | $\frac{1}{2}, \frac{3}{4}, \frac{4}{5}, \frac{5}{6}$ | 2 | B2 | can be given as fraction, decimal or percentage equivalents<br><br>B1 for 3 fractions in the correct order **or** for 4 in fractions in the correct reverse order **or** for 2 fractions correctly converted to decimals or percentages **or** 2 fractions written with a common denominator that is a multiple of 60 |
| | d | $14 \div 5 \times 9$ | | | M1 | |
| | | | 25.2 | 2 | A1 | oe |
| | | | | | | **Total 6 marks** |

| | | | | | | |
|---|---|---|---|---|---|---|
| **7** | a | | 3 | 1 | B1 | |
| | b | $\frac{12}{60} \times 360$ or $360 \div 60 \times 12$ or<br>$360 \div (60 \div 12)$ oe or<br>$\left(\frac{12}{60} \times 100\right) \frac{20}{100} \times 360$ | | | M1 | M1 Allow two stages e.g.<br>$\left(\frac{12}{60} \times 100\right) \frac{20}{100} \times 360$ |
| | | | 72 | 2 | A1 | |
| | c | $\frac{35}{100} \times 60$ or $0.35 \times 60$ oe | | | M1 | |
| | | | 21 | 2 | A1 | |
| | | | | | | **Total 5 marks** |

| Question | | Working | Answer | Mark | Notes |
|---|---|---|---|---|---|
| **5** | (a) | | 12 squares shaded | 1 | B1 can be any 12 squares shaded – use professional judgement as to whether a square is shaded or not |
| | (b) | | $\frac{14}{17}$ | 1 | B1 with no others may be indicated in list |
| | (c) | | 30 | 1 | B1 |
| | (d) | | $8\frac{5}{9}$ | 1 | B1 |
| | (e) | $40 \div 5 \times 6$ oe eg $\frac{6}{5} \times 40$ oe | | 2 | M1 A fully correct method |
| | | *Working not required, so correct answer scores full marks (unless from obvious incorrect working)* | 48 | | A1 trial and improvement scores no marks unless fully correct |
| | | | | | **Total 6 marks** |

| Question | | Working | Answer | Mark | Notes |
|---|---|---|---|---|---|
| 6 | | | 1H, 1T, 2H, 2T, 3H, 3T, 4H, 4T, 5H, 5T, 6H, 6T | 2 | B2 for all 12 combinations and no extras or repeats<br><br>If not B2 then B1 for at least 4 correct combinations (ignoring repeats) |
| 7 | | | Triangle at (3, 0) (3, −3) (5, −3) | 2 | M1 for line $y = 1$ drawn or correct reflection in any line parallel to the $x$-axis<br>A1 SCB1 for correct reflection in $x = 1$ |
| 8 | (a) | | $3\frac{4}{5}$ | 1 | B1 |
| | (b) | 84 – 10 – 45 (=29) | $\frac{29}{84}$ | 2 | M1<br>A1 SCB1 for $\frac{55}{84}$ |
| | (c) | 0.75, 0.916…, 0.625, 0.45 | $\frac{9}{20}, \frac{5}{8}, \frac{3}{4}, \frac{11}{12}$ | 2 | M1 for conversion to common form<br>A1 SC :if M0 award B1 for any 3 fractions in the correct order or for all fractions in correct reverse order |
| | (d) | $\frac{23}{24} - \frac{9}{24}$ oe | shown | 2 | M1 for two fractions with a common denominator with at least one numerator correct<br>A1 for $\frac{14}{24}$ oe and then $\frac{7}{12}$ |

| | | | | | | |
|---|---|---|---|---|---|---|
| **9** | (a) | eg 0.7, 0.8, 0.5, 0.725<br>eg $\frac{28}{40}, \frac{32}{40}, \frac{20}{40}, \frac{29}{40}$ | | 2 | M1 | for converting all four fractions to a common form e.g. common denominators or decimals or 3 fractions in the correct order or correct reverse order |
| | | | $\frac{1}{2}, \frac{7}{10}, \frac{29}{40}, \frac{4}{5}$ | | A1 | Any correct form |
| | (b) | eg $\frac{16}{30} + \frac{9}{30}$ **or**<br>$\begin{array}{\|c\|c\|c\|}\hline & 8 & 15 \\ \hline 3 & & 45 \\ \hline 10 & 80 & 150 \\ \hline\end{array}$ **and** $\frac{125}{150}$ | | 2 | M1 | for $\frac{16}{30}$ and $\frac{9}{30}$ **or**<br>both fractions expressed as equivalent fractions with denominators that are a common multiple of 10 and 15<br>eg. $\frac{80}{150}$ and $\frac{45}{150}$ |
| | | eg $\frac{16}{30} + \frac{9}{30} = \frac{25}{30} = \frac{5}{6}$ | shown | | A1 | conclusion to given answer coming from correct working which shows all steps |

See next page for part 9(c)

| Question | | Working | Answer | Mark | Notes |
|---|---|---|---|---|---|
| 9 | (c) | e.g. $\frac{14}{3}$ **and** $\frac{10}{9}$ | | | M1 Both fractions expressed as improper fractions |
| | | e.g. $\frac{14}{3} \times \frac{9}{10}$ | | | M1 **or** for both fractions expressed as equivalent fractions with denominators that are a common multiple of 3 and 9 eg. $\frac{42}{9} \div \frac{10}{9}$ **or** $\frac{126}{27}, \frac{30}{27}$ |
| | | e.g. $\frac{14}{3} \times \frac{9}{10} = \frac{126}{30} = \frac{21}{5} = 4\frac{1}{5}$<br>**or** $\frac{14}{3} \times \frac{9}{10} = \frac{126}{30} = 4\frac{6}{30} = 4\frac{1}{5}$<br>**or** $\frac{\cancel{14}^{7}}{3^{1}} \times \frac{\cancel{9}^{3}}{\cancel{10}^{5}} = \frac{21}{5} = 4\frac{1}{5}$<br>**or** $\frac{126}{27}, \frac{30}{27} = \frac{126}{30} = \frac{21}{5} = 4\frac{1}{5}$ | Shown | 3 | A1 Dep on M2 for conclusion to $4\frac{1}{5}$ from correct working – either sight of the result of the multiplication e.g. $\frac{126}{30}$ must be seen or correct cancelling prior to the multiplication to $\frac{21}{5}$<br>NB: use of decimals scores no marks |
| | | | | | **Total 3 marks** |

| | | | | | | |
|---|---|---|---|---|---|---|
| **8** | (a) | 20 + 45 or 20 + 9 × 5 | | 2 | M1 | |
| | | | 65 | | A1 | |
| | (b) | 164 – 20 (= 144) | | 3 | M1 | |
| | | '144' ÷ 9 (= 16) | | | M1 | |
| | | | 16 | | A1 | cao |
| | (c) | | | 2 | M1 | for $T = an + 20$ or $T = 9n + k$ or $9n + 20$ |
| | | | $T = 9n + 20$ | | A1 | for $T = 20 + 9n$ or $T = 9n + 20$ |
| | | | | | | **Total 7 marks** |

| | | | | | | |
|---|---|---|---|---|---|---|
| **9** | (a) | | 28 | 1 | B1 | cao |
| | (b) | | 18 | 1 | B1 | cao |
| | (c) | | 0.85 | 1 | B1 | cao |
| | (d) | $\frac{45}{60}, \frac{24}{60}, \frac{28}{60}, \frac{40}{60}$ or<br>0.75, 0.4, 0.466…, 0.666… or<br>75%, 40%, 46.6%, 66.6% | | 2 | M1 | for a method to compare the fractions<br><br>If M0, award B1 for any three of these fractions in the correct order or for all fractions (or dec or perc) in correct reverse order |
| | | | $\frac{2}{5}, \frac{7}{15}, \frac{2}{3}, \frac{3}{4}$ | | A1 | allow answers in any form (dec or perc) |
| | (e) | $\frac{36}{96}$ oe | | 2 | M1 | for fraction or for partial simplification. |
| | | | $\frac{3}{8}$ | | A1 | cao<br>correct answer scores full marks |
| | | | | | | **Total 7 marks** |

| | | | | | | |
|---|---|---|---|---|---|---|
| **3** | (a) | Allow 21 thousand | 21 | 1 | B1 | Could be written at the top of the bar for Egypt if not on answer line |
| | (b) | | 12 | 1 | B1 | |
| | (c) | | Bar completed to show 17 thousand | 1 | B1 | Bar can be of any width |
| | | | | | | **Total 3 marks** |

| | | | | | | |
|---|---|---|---|---|---|---|
| **4** | (a) | | 9 squares (3 columns) shaded | 1 | B1 | Any 9 squares shaded. |
| | (b) | | $\frac{18}{24}, \frac{12}{16}$ | 2 | B2 | For both and no others.<br>B1 for one correct with no more than one incorrect |
| | (c) | | $3\frac{3}{7}$ | 1 | B1 | Must be written like this and not as a decimal |
| | (d) | Accept 90% in answer space | 90 | 1 | B1 | Allow 'ninety' |
| | (e) | $\frac{2}{5}\times 80$ oe or $1-\frac{2}{5}\left(=\frac{3}{5}\right)$ or ÷5, ×3 or 32 | | 2 | M1 | we would accept $\frac{32}{80}$ or $\frac{48}{80}$ for M1 |
| | | *Correct answer scores full marks (unless from obvious incorrect working)* | 48 | | A1 | |
| | | | | | | **Total 7 marks** |

| | | | | | | |
|---|---|---|---|---|---|---|
| **6** | (a) | E.g. $\frac{6}{10}, \frac{9}{15}, \frac{12}{20}, \frac{15}{25}, \frac{18}{30}, \frac{21}{35}$ | | 2 | M1 | for any fraction equivalent to $\frac{24}{40}$ with denominator less than 40 |
| | | | $\frac{3}{5}$ | | A1 | |
| | (b) | | 0.2 | 1 | B1 | |
| | (c) | | $\frac{3}{10}$ oe | 1 | B1 | |
| | (d) | $\frac{9n}{24n} + \frac{1n}{24n}$ or $\frac{9n+1n}{24n}$ | | 2 | M1 | for correct fractions with a common denominator (multiple of 24) |
| | | eg $\frac{10}{24} = \frac{5}{12}$ | Shown | | A1 | for a multiple of $\frac{10n}{24n} = \frac{5}{12}$ |
| | (e) | $\frac{1}{2} \times 280$ (= 140) oe **or** $\frac{2}{5} \times 280$ (= 112) oe | | 3 | M1 | |
| | | 280 – '140' – '112' | | | M1 | |
| | | | 28 | | A1 | |
| | | **Alternative method** | | | | |
| | | $\frac{1}{2} + \frac{2}{5} \left(= \frac{9}{10}\right)$ or 0.5 + 0.4 (= 0.9) oe | | 3 | M1 | |
| | | $\left(1 - '\frac{9}{10}'\right) \times 280$ or (1 – '0.9') × 280 oe | | | M1 | |
| | | | 28 | | A1 | |
| | | | | | | **Total 9 marks** |

| | | | | | |
|---|---|---|---|---|---|
| **3** | (3.7 + 6.1) ÷ 2 oe or<br>6.1 – ((6.1 – 3.7) ÷ 2) oe or<br>3.7 + ((6.1 – 3.7) ÷ 2) oe | | 2 | M1 | Allow list of decimals from 3.7 to 6.1 showing a method to find halfway (eg crossing of each end to get to the middle) Allow one error in the list. |
| | *Working not required, so correct answer scores full marks (unless from obvious incorrect working)* | 4.9 | | A1 | oe |
| | | | | | **Total 2 marks** |

| | | | | | | |
|---|---|---|---|---|---|---|
| **4** | (a) | | $30d$ | 1 | B1 | Allow $d30$ but not $30\times d$ |
| | (b) | | $4e$ | 1 | B1 | cao |
| | (c) | | 7 | 1 | B1 | cao |
| | (d) | | 14 | 1 | B1 | cao |
| | | | | | | **Total 4 marks** |

**International GCSE Maths**

**Apart from questions 12, 19 the correct answer, unless clearly obtained by an incorrect method, should be taken to imply a correct method**

**Values in quotation marks must come from a correct method previously seen unless clearly stated otherwise.**

| Q | | Working | Answer | Mark | Notes |
|---|---|---|---|---|---|
| **1** | (a) | | 15 or 19 | 1 | B1 or for both values and no other values |
| | (b) | | 48 | 1 | B1 cao |
| | (c) | | 19 | 1 | B1 cao |
| | (d) | | 6 | 1 | B1 cao |
| | | | | | **Total 4 marks** |

| | | | | | |
|---|---|---|---|---|---|
| **2** | (a) | | $\frac{13}{100}$ | 1 | B1 oe eg $\frac{130}{1000}$ |
| | (b) | | 4 | 1 | B1 for 4 in the box |
| | | | | | **Total 2 marks** |

| International GCSE Maths | | | | | |
|---|---|---|---|---|---|
| **Apart from questions 19 and 24 the correct answer, unless clearly obtained by an incorrect method, should be taken to imply a correct method** | | | | | |
| **Q** | | **Working** | **Answer** | **Mark** | **Notes** |
| **1** | (i) | | 13 or 23 | 1 | B1 |
| | (ii) | | 36 | 1 | B1 |
| | (iii) | | 14 | 1 | B1 |
| | | | | | ***Total 3 marks*** |

| | | | | | |
|---|---|---|---|---|---|
| **2** | (a) | | 0.5, 0.501, 0.51, 0.55 | 1 | B1 |
| | (b) | | $\frac{3}{10}$ | 1 | B1 for $\frac{3}{10}$ oe eg $\frac{30}{100}$ |
| | (c) | | 0.47 | 1 | B1 |
| | | | | | ***Total 3 marks*** |

| | | | | | |
|---|---|---|---|---|---|
| **3** | 20 ÷ 4 ( = 5) **or** width = 15 **or** length = 20 | | 3 | M1 | Could be clearly shown on diagram |
| | (4 × '5') × (3 × '5') **or** 20 × 15 **or** ('5' × '5') × 12 **or** 25 × 12 | | | M1 | dep on M1 |
| | | 300 | | A1 | for 300<br>SCB1 for 60 × 80 (=4800) |
| | | | | | ***Total 3 marks*** |

| | | | | | | |
|---|---|---|---|---|---|---|
| **11** | (a) | eg 15.59 **or** 0.477 **or** 0.478 **or** 0.4778 **or** 0.4779 **or** $\frac{745}{1559}$ | | 2 | M1 | for calculating the denominator **or** for answer with 3 or 4 dp **or** for the correct fraction |
| | | | 0.47787(04298…) | | A1 | must have minimum of 5 dp |
| | (b) | | 0.478 | 1 | B1ft | dep on at least 4 decimal places |
| | | | | | | **Total 3 marks** |

| | | | | | |
|---|---|---|---|---|---|
| **12** | $C - 5$ oe **or** $2C$ oe **or** $T$ = a linear expression in $C$ | | 3 | M1 | for one of $C - 5$ oe **or** $2C$ oe **or** $T$ = linear expression in $C$ |
| | $C + C - 5 + 2C$ $(= 4C - 5)$ oe **or** for $T$ = an expression in $C$ with the expression in $C$ coming from adding at least 2 of $C$, $2C$, $C - 5$ eg $T = 2C + C - 5$ or $T = C + C^2 + C - 5$ | | | M1 | |
| | | $T = 4C - 5$ | | A1 | oe but must be simplified eg allow $T = 4 \times C - 5$ |
| | | | | | **Total 3 marks** |

**International GCSE Maths**

**Apart from Questions 5, 18, 20, 22 the correct answer, unless clearly obtained by an incorrect method, should be taken to imply a correct method**

| Q | | Working | Answer | Mark | Notes |
|---|---|---|---|---|---|
| 1 | (a) | | 7, 58, 123, 180, 202 | 1 | B1 |
| | (b) | | 0.015, 0.15, 0.155, 1.15, 1.5 | 1 | B1 |
| | (c) | | 5203 | 1 | B1 |
| | (d) | | tens | 1 | B1 oe eg 6 tens, 60, ten(s), sixty, |
| | | | | | **Total 4 marks** |

| | | | | | |
|---|---|---|---|---|---|
| 2 | (a) | | Bar drawn of height 8 | 1 | B1 |
| | (b) | | USA | 1 | B1 |
| | (c) | | France | 1 | B1 |
| | (d) | | 13 | 1 | B1 Allow 13 000 000 |
| | | | | | **Total 4 marks** |

| | | | | | |
|---|---|---|---|---|---|
| 3 | (a) | | 3.76 | 1 | B1 |
| | (b) | | Arrow pointing at 0.04 | 1 | B1 |
| | (c) | | 5.7 | 1 | B1 Allow 5,7 |
| | | | | | **Total 3 marks** |

| | | | | | |
|---|---|---|---|---|---|
| 4 | (a) | | Parallelogram drawn | 1 | B1 |
| | (b)(i) | | Pyramid | 1 | B1 accept square based pyramid or rectangular based pyramid |
| | (ii) | | 5 | 1 | B1 Allow five |
| | | | | | **Total 3 marks** |

| | | | | | |
|---|---|---|---|---|---|
| **5** | (a) | | $\frac{2}{3}$ | 1 | B1 allow 0.67 or better |
| | (b) | | $\frac{4}{5}$ and $\frac{12}{15}$ | 1 | B1 |
| | (c) | | 0.7 | 1 | B1 allow 0.7(000…) |
| | | | | | **Total 3 marks** |

| | | | | | |
|---|---|---|---|---|---|
| **6** | (a) | | 8 | 1 | B1 cao |
| | (b) | 40 – (“8” + 14 + 11) oe or 40 – 33 or or 18 – 11 or 21 – 14 or 15 – “8” | | 3 | M1 for 40 minus their 3 readings (allow one incorrect reading from 8 or 14 or 11) |
| | | 7 | | | A1(ft for 15 – “8” or 40 – (“8” + 14 + 11)) |
| | | *Correct answer scores full marks (unless from obvious incorrect working)* | Correct height of bar | | A1 ft dep on M1<br>± half square tolerance for height of bar<br>Award 3 marks for a fully correct bar of height of 7 |
| | | | | | **Total 4 marks** |

| | | | | | | |
|---|---|---|---|---|---|---|
| **13** | (a) | | | 2 | M1 | for 2.4544 or 17.5 or 17.53 or $\frac{3068}{175}$ |
| | | *Correct answer scores full marks (unless from obvious incorrect working)* | 17.531(…….) | | A1 | At least 5 sf |
| | (b) | | 17.5 | 1 | B1 | ft a number with 2 or more decimal places |
| | | | | | | **Total 3 marks** |

| | | | | | |
|---|---|---|---|---|---|
| **14** | (side of square = ) $\sqrt{49}(=7)$<br><br>7 could also be seen as part of a calculation eg<br>7 + 7 + 7….. | | 3 | M1 | could be on the diagram |
| | Other side of triangle = $(27-"7")\div 2(=10)$ or<br>2 sides of triangle = 27 – "7" (= 20)<br><br>10 or 20 could also be seen as part of a calculation eg<br>7 + 7 +…+ 10 + 10 or<br>7 + 7 + …+ 20 | | | M1 | dep on M1<br><br>**but we will allow**<br>use of their side of square when assuming 49 is the perimeter<br>eg $\frac{27-12.25}{2}(=7.375)$ or<br>27 – 12.25 (= 14.75) |
| | *Correct answer scores full marks (unless from obvious incorrect working)* | 41 | | A1 | |
| | | | | | **Total 3 marks** |

| International GCSE Maths A June 2018 – Paper 2F Mark scheme | | | | | |
|---|---|---|---|---|---|
| **Apart from Questions 20 and 23 where the mark scheme states otherwise, the correct answer, unless clearly obtained by an incorrect method, should be taken to imply a correct method.** | | | | | |
| **Question** | | **Working** | **Answer** | **Mark** | **Notes** |
| **1** | (a) | | $\frac{63}{100}$ | 1 | B1 |
| | (b) | | 46800 | 1 | B1 |
| | (c) | | 73.7 | 1 | B1 |
| | (d) | | 9 | 1 | B1 |
| | | | | | **Total 4 marks** |

| | | | | | | |
|---|---|---|---|---|---|---|
| **2** | (a) | | E | 1 | B1 | Accept 0.2 |
| | (b) | | D | 1 | B1 | |
| | (c) | | C | 1 | B1 | Accept 0.5 |
| | | | | | | **Total 3 marks** |

| | | | | | |
|---|---|---|---|---|---|
| **3** | 400 and 1300 or 900 | | 3 | M1 | read scales correctly **or** 1300 × 0.4 (=520) **or** 400 × 0.4 (=160) **or** 9 × 0.4 (=3.6) **or** ($x$ – $y$) × 0.4 where $x$ and $y$ are readings and $x$ = 1300 or $y$ = 400 |
| | $(1300-400)\times 0.4$ **or** "520" – "160" | | | M1 | Difference of both correct readings × 0.4 oe |
| | | 360 | | A1 | cao |
| | | | | | **Total 3 marks** |

| International GCSE Maths | | | | | | |
|---|---|---|---|---|---|---|
| **Apart from Questions 12c, 18, 21 and 23, the correct answer, unless clearly obtained by an incorrect method, should be taken to imply a correct method** | | | | | | |
| **Q** | | **Working** | **Answer** | **Mark** | | **Notes** |
| 1 | (a) | | 25 | 1 | B1 | cao |
| | (b) | | 1 and ½ squares | 1 | B1 | Oe the half symbol can be drawn in any direction. |
| | (c) | | Monday | 1 | B1 | M or Mon (allow incorrect spelling if meaning is clear) |
| | (d) | 20 + 55 + 40 + '25' + 30 | | 2 | M1 | check by side of pictogram for working – allow values without '+' signs if clear attempt to add (allow one error or omission) |
| | | | 170 | | A1 | cao |
| | | | | | | **Total 5 marks** |

| | | | | | | |
|---|---|---|---|---|---|---|
| **2** | (a) | | 2.001, 2.07, 2.1, 2.12, 2.19 | 1 | B1 | cao |
| | (b) | | 6 tenths | 1 | B1 | oe eg tenths, six tenths, $\frac{6}{10}$ (do not allow 0.6 or .6) |
| | (c) | | 3.49 | 1 | B1 | cao |
| | (d) | | 60 | 1 | B1 | cao |
| | | | | | | **Total 4 marks** |

| Question | | Working | Answer | Mark | Notes |
|---|---|---|---|---|---|
| **3** | (a) | | $\frac{3}{100}$ | 1 | B1 $\frac{3}{100}$, 3/100 oe eg $\frac{6}{200}$, $\frac{9}{300}$, $\frac{30}{1000}$ etc |
| | (b) | | 90 | 1 | B1 Allow 90% |
| | (c) | | 0.204, 0.24, 0.4, 0.408, 0.48 | 1 | B1 oe eg 0.204, 0.240, 0.400, 0.408, 0.480 (this includes extra zero's after the correct decimal which is acceptable) |
| | (d) | | 1.63 | 1 | B1 oe 1.63(000…) |
| | | | | | **Total 4 marks** |

| | | | | | | |
|---|---|---|---|---|---|---|
| **5** | (a) | | 60 | 1 | B1 | cao |
| | (b) | | 0.19 | 1 | B1 | |
| | (c) | $\frac{16}{20}$ oe eg $\frac{8}{10}$ or answer of $\frac{1}{5}$ | | 2 | M1 | for a correct unsimplified fraction eg $\frac{16}{20}$<br>**or** answer of $\frac{1}{5}$ or 0.8 or 80%<br>**or** for any fraction that will cancel written in simplest form eg $\frac{15}{20}=\frac{3}{4}$ or $\frac{4}{16}=\frac{1}{4}$ |
| | | *Correct answer scores full marks (unless from obvious incorrect working)* | $\frac{4}{5}$ | | A1 | cao<br>NOTE: do not ISW eg $\frac{4}{5}$ then answer of 0.8 or 80% is M1A0 |
| | | | | | | **Total 4 marks** |

| | | | | | | |
|---|---|---|---|---|---|---|
| **6** | (a) | | 23 | 1 | B1 | cao |
| | (b) | | Added 4 | 1 | B1 | **Acceptable examples**<br>add 4<br>+4<br>19 + 4 (= 23)<br>(rule is) $4n + 3$<br>goes up by 4<br>4 × 5 + 3 (= 23)<br>($n$) + 4<br>($3n$) + 4<br><br>**Not acceptable examples**<br>11 – 7 = 4<br>difference is 4<br>we subtract the first number and the next number and it gives us the answer |
| | (c) | | 51 | 1 | B1 | cao |
| | | | | | | **Total 4 marks** |

| International GCSE Mathematics | | | | | |
|---|---|---|---|---|---|
| **Values in quotation marks must come from a correct method previously seen unless clearly stated otherwise.** | | | | | |
| **Q** | | **Working** | **Answer** | **Mark** | **Notes** |
| **1** | (a) | | 46 83 99 148 229 | 1 | B1 cao |
| | (b) | | 0.08 0.25 0.417 0.46 0.5 | 1 | B1 cao |
| | (c) | | $\frac{81}{100}$ | 1 | B1 oe fraction |
| | (d) | | 0.25 | 1 | B1 allow $\frac{1}{4}$ oe |
| | | | | | **Total 4 marks** |

| | | | | | |
|---|---|---|---|---|---|
| **2** | (a) | | 9 | 1 | B1 cao |
| | (b) | 2 4 6 7 9 9 10 **or** 10 9 9 7 6 4 2 | | 2 | M1 for ordering the numbers allow one error or one omission |
| | | *Correct answer scores full marks (unless from obvious incorrect working)* | 7 | | A1 |
| | (c) | | 8 | 1 | B1 cao |
| | | | | | **Total 4 marks** |

| | | | | | |
|---|---|---|---|---|---|
| **3** | (a)(i) | | Cube | 1 | B1 allow misspelling, allow cuboid Allow prism or square prism or rectangular prism |
| | (ii) | | 12 | 1 | B1 cao |
| | (b) | | B and D | 1 | B1 allow D and B (or b and d etc) |
| | (c) | | C | 1 | B1 allow c |
| | | | | | **Total 4 marks** |

| Question | | Working | Answer | Mark | Notes |
|---|---|---|---|---|---|
| **1** | (a) | | 0.23 | 1 | B1 |
| | (b) | | 70 | 1 | B1 |
| | (c) | | 0.2 | 1 | B1 |
| | (d) | | 6 triangles shaded | 1 | B1 |
| | (e) | | 79 | 1 | B1 |
| **2** | ai | | Likely | 1 | B1 |
| | aii | | Impossible | 1 | B1 |
| | (b) | | × at $\frac{3}{10}$ | 1 | B1 |
| **3** | | 150 ÷ 6 (=25) or 6 × 25 = 150 or 1.03 ÷ 6 (=0.17…) | | | M1 |
| | | "25" × 1.03 or "0.17…" × 150 | | | M1 dep |
| | | | 25.75 | 3 | A1 |
| **4** | (a) | | 5*m* | 1 | B1 |
| | (b) | | 35*p* | 1 | B1 |
| | (c) | | 5 | 1 | B1 |
| | (d) | | 15 | 1 | B1 |

| Question | | Working | Answer | Mark | Notes |
|---|---|---|---|---|---|
| 1 | (a) | | 7.002, 7.013, 7.04, 7.831, 7.9 | 1 | B1 |
| | (b) | | 0.07 | 1 | B1 |
| | (c) | | $\frac{47}{100}$ | 1 | B1 |
| | (d) | | 63 | 1 | B1 |
| | (e) | | 3000 | 1 | B1 |
| | | | | | **Total 5 marks** |

| Question | Working | Answer | Mark | Notes | |
|---|---|---|---|---|---|
| 2 | 700 or 0.45 | 15 | 3 | M1 for a correct conversion | M2 for $45 \times 15 = 675$ or $0.45 \times 15 = 6.75$ |
| | $\frac{"700"}{45}$ or $\frac{7}{"0.45"}$ or 15.555.... or $\frac{140}{9}$ or $15\frac{5}{9}$ | | | M1 Units may not be consistent ft from their incorrect conversion | |
| | | | | A1 | |
| | | | | | **Total 3 marks** |

| | | | | | | |
|---|---|---|---|---|---|---|
| **5** | a | | 0.003, 0.035, 0.5, 0.539, 0.9 | 1 | B1 | |
| | b | | 60 | 1 | B1 | allow 60% |
| | c | | $8\frac{4}{7}$ | 1 | B1 | oe |
| | d | 0.95 – 0.68 **or** $\frac{95}{100} - \frac{68}{100}$ **or** $\frac{19}{20} - 0.68$ oe | | 2 | M1 | or $\frac{27}{100}$ or 27% |
| | | | 0.27 | | A1 | |
| | | | | | | **Total 5 marks** |

| | | | | | | |
|---|---|---|---|---|---|---|
| **6** | a | | 23 | 1 | B1 | |
| | b | | Added 4 | 1 | B1 | accept +4, 4 more, oe, $4n - 1$ (need to know 4 and we need to add/go up oe) |
| | c | (23) 27, 31, 35, 39, 43, 47, 51, 55, 59, 63, 67, 71<br>**OR** $4n - 1 = 70$ | | 2 | M1 | allow list of numbers going up in 4's up to 71 or more (allow one error) |
| | | | 71 | | A1 | |
| | d | No and identifying all terms in sequence are odd<br>**OR**<br>No and method to count on as far as 95 (or clearly showing 95)<br>**OR**<br>No and method to find $n$ when term is 96<br>e.g. solving $4n - 1 = 96$ | No with reason | 1 | B1 | must have 'No' oe or 'is not' oe and a reason. |
| | | | | | | **Total 5 marks** |

| | | | | | |
|---|---|---|---|---|---|
| **4** | (a) | | $\frac{57}{100}$ | 1 | B1 cao |
| | (b) | | 2 | 1 | B1 cao |
| | (c) | | $\frac{6}{7}$ | 1 | B1 cao |
| | (d) | | $4\frac{2}{5}$ | 1 | B1 cao |
| | (e) | | 78 | 1 | B1 cao |
| | | | | | **Total 5 marks** |

| | | | | | | |
|---|---|---|---|---|---|---|
| **3** | (a) | | 14 squares shaded | 1 | B1 | any 14 squares shaded |
| | (b) | | two tenths | 1 | B1 | allow 'tenths' or $\frac{2}{10}$ |
| | (c) | | 0.625 | 1 | B1 | |
| | (d) | | 2.008, 2.081, 2.8, 2.803, 2.83 | 2 | B2<br><br>(B1 | for all numbers in correct order<br><br>for one number when covered leaves the others in order **or** for all numbers in correct reverse order) |
| | | | | | | **Total 5 marks** |

| | | | | | | |
|---|---|---|---|---|---|---|
| **4** | (a) | | 4.5 cm or 45 mm | 2 | B2<br><br>(B1 | for 4.5 cm or 45 mm (allow 4.3 – 4.7 cm or 43 – 47 mm)<br><br>for 4.5 (allow 4.3 – 4.7) **or** 45 (allow 43 – 47) **or** cm with a value from 4 – 5 **or** mm with a value from 40 – 50) |
| | (b) | | 29 | 1 | B1 | (+ 2) |
| | (c) | | the pair of parallel sides marked | 1 | B1 | only 2 sides marked correctly |
| | (d) | | pentagon | 1 | B1 | |
| | | | | | | **Total 5 marks** |

| | | | | | |
|---|---|---|---|---|---|
| **3** | (a) | | cylinder | 1 | B1 allow circular prism |
| | (b) | | 12 | 1 | B1 |
| | | | | | **Total 2 marks** |

| | | | | | |
|---|---|---|---|---|---|
| **4** | (a) | | 34 | 1 | B1 |
| | (b) | | 18 | 1 | B1 |
| | | | | | **Total 2 marks** |

| | | | | | |
|---|---|---|---|---|---|
| **5** | (a) | | 64 | 1 | B1 |
| | (b) | | 0.45 | 1 | B1 |
| | (c) | | $\frac{3}{8}$ | 1 | B1 |
| | (d) | | $2\frac{3}{4}$ | 1 | B1 |
| | (e) | | square | 1 | B1 |
| | | | | | **Total 5 marks** |

| | | | | |
|---|---|---|---|---|
| **6** | 24 ÷ 4 (= 6) **or** width = 24 | | 3 | M1 Could be clearly shown on diagram. |
| | 10 × '6' oe **or**<br>24 + 24 + 6 + 6 oe | | | M1 dep M1 |
| | | 60 | | A1 SC if no other marks scored B1 for 24 × 4 (= 96) |
| | | | | **Total 3 marks** |

| | | | | | |
|---|---|---|---|---|---|
| **4** | (a) | | 80 | 1 | B1 |
| | (b) | | thousandth | 1 | B1 oe e.g. 3 thousandth, $1000^{th}$, $\frac{1}{1000}$ $\frac{3}{1000}$, 0.003 |
| | (c) | | 0.04 0.042 0.2 0.204 0.24 | 1 | B1 |
| | (d) | | 25.79 | 1 | B1 |
| | (e) | | 36 | 1 | B1 |
| | | | | | **Total 5 marks** |

| | | | | | |
|---|---|---|---|---|---|
| **5** | (a)(i) | | A cross at 0.5 | 1 | B1 |
| | (ii) | | unlikely | 1 | B1 |
| | (b) | **Type of rice** / **Tally** / **Frequency**: arborio / 𝍸 / 4; basmati / 𝍸 I / 6; jasmine / 𝍸 II / 7; wild / III / 3 | | 2 | B2 for all frequencies correct (B1 for 2 frequencies correct or 2 tallies correct or 1 tally with its frequency correct) |
| | | | | | **Total 4 marks** |

| | | | | | |
|---|---|---|---|---|---|
| **7** | (a) | | 0.405, 0.45, 0.5, 0.504, 0.54 | 1 | B1 |
| | (b) | | 8 | 1 | B1 |
| | (c) | | $3\frac{4}{9}$ | 1 | B1 |
| | (d) | 0.28 or $\frac{22}{25}$ or $\frac{\frac{7}{25}+0.88}{2}$ oe | | 2 | M1 |
| | | *Correct answer scores full marks (unless from obvious incorrect working)* | 0.58 | | A1 oe eg $\frac{29}{50}$ |
| | | | | | **Total 5 marks** |

| | | | | | |
|---|---|---|---|---|---|
| **8** | (a) | | | 3 | B3 Fully correct table<br>If not B3, then<br>B2 for 4 or 5 correct<br>B1 for 2 or 3 correct |
| | (b) | $\frac{22}{80}$ | | 2 | M1 |
| | | | $\frac{11}{40}$ | | A1 |
| | | | | | **Total 5 marks** |

| | apple pie | fruit | ice cream | Total |
|---|---|---|---|---|
| **Year 5** | | | 8 | 36 |
| **Year 6** | 34 | 8 | | |
| **Total** | | 14 | 10 | |

| | | | | | |
|---|---|---|---|---|---|
| **4** | (a) | | 0.9 | 1 | B1 |
| | (b) | | 6 | 1 | B1 |
| | (c) | | 15 squares shaded | 1 | B1 |
| | (d) | | $\frac{2}{500}$ | 1 | B1 |
| | (e) | eg $\frac{32-8}{32}$ oe or $1-\frac{8}{32}$ oe or $\frac{32}{32}-\frac{8}{32}$ oe or $\frac{24}{32}$ or 0.75 or $\frac{1}{4}$ | | 2 | M1 |
| | | *Correct answer scores full marks (unless from obvious incorrect working)* | $\frac{3}{4}$ | | A1 |
| | | | | | **Total 6 marks** |

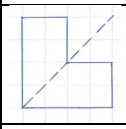
| | | | | | |
|---|---|---|---|---|---|
| **5** | (a) | | $28ef$ | 1 | B1 |
| | (b) | | $d^5$ | 1 | B1 |
| | (c) | | $4a - 5k$ | 2 | B2 for $4a - 5k$ (B1 for $4a$ or $-5k$ **or** $4a + -5k$) |
| | (d) | | 9 | 1 | B1 |
| | (e) | $2r = 14 + 9$ or $2r = 23$ oe **or** $(14 + 9) \div 2$ **or** $2 \times 11.5 - 9 = 14$ | | 2 | M1 for a correct first step **or** a correct calculation for $r$ |
| | | *Correct answer scores full marks (unless from obvious incorrect working)* | 11.5 | | A1 for 11.5 or $\frac{23}{2}$ or $11\frac{1}{2}$ |
| | | | | | **Total 7 marks** |

| | | | | | |
|---|---|---|---|---|---|
| **3** | (a) | $\frac{72}{100}, \frac{36}{50}$ | | 2 | M1 Or other fraction equivalent to $\frac{18}{25}$ |
| | | | $\frac{18}{25}$ | | A1 |
| | (b) | | 75 | 1 | B1 |
| | (c) | e.g. $\frac{65}{100} \times 720$, 0.65 × 720, 720 ÷ 100 × 65 oe | | 2 | M1 |
| | | | 468 | | A1 |
| | (d) | $\frac{9}{20} = 0.45$ **or** $\frac{4}{9} = 0.44...$ | | 2 | M1 **OR** 4 out of 5 numbers in the correct order **OR** correct reverse order |
| | | | 40.5%, 0.427, 0.43, $\frac{4}{9}, \frac{9}{20}$ | | A1 oe |
| | | | | | **Total 7 marks** |

| | | | | | |
|---|---|---|---|---|---|
| **4** | (a) | | | 2 | M1 Any rectangle |
| | | e.g. Rectangle 1 × 6, 2 × 5, 3 × 4, 3.5 × 3.5 | Rectangle with perimeter 14 cm | | A1 |
| | (b) | | | 2 | M1 Any right-angled triangle or any triangle with area 12 cm² |
| | | | Right-angled triangle with area 12 cm² | | A1 e.g. B 4 cm & H 6 cm, B 3 cm & H 8 cm |
| | | | | | **Total 4 marks** |

| | | | | | | |
|---|---|---|---|---|---|---|
| **5** | (a) | | 2.0034, 2.08, 2.111, 2.13, 2.7 | 1 | B1 | All five numbers must be present<br>may include extra zero's eg 2.7000 |
| | (b) | | 5.84 | 1 | B1 | cao |
| | (c) | | $\frac{73}{100}$ | 1 | B1 | oe eg $\frac{730}{1000}$<br>Do not allow $\frac{7.3}{10}$ |
| | (d) | | (6) hundredths | 1 | B1 | $\frac{6}{100}$ (not 0.06)<br>Accept incorrect spelling if meaning is clear<br>NB not hundreds |
| | (e) | | 0.17 | 1 | B1 | Accept (….000000).17<br>Allow comma for decimal point |
| | (f) | $252 \div 0.7(0)$ oe or $252 \div \frac{70}{100}$ oe or $\frac{252 \times 100}{70}$ oe | | 2 | M1 | |
| | | *Working not required, so correct answer scores full marks (unless from obvious incorrect working)* | 360 | | A1 | Trial and error scores zero marks unless correct answer is clearly seen |
| | | | | | | **Total 7 marks** |

| International GCSE Maths | | | | | |
|---|---|---|---|---|---|
| **Apart from questions 20 and 26 the correct answer, unless clearly obtained by an incorrect method, should be taken to imply a correct method** | | | | | |
| **Q** | | **Working** | **Answer** | **Mark** | **Notes** |
| **1** | (a) | | 30 | 1 | B1 |
| | (b) | | 0.29 | 1 | B1 |
| | (c) | | 0.85 | 1 | B1 |
| | (d) | | −9, −7, −3, 8, 16 | 1 | B1 |
| | (e) | | 0.009, 0.04, 0.044, 0.104, 0.2 | 1 | B1 extra zeros at the end are fine and the numbers may be separated by any signs eg < or , etc |
| | (f) | $1-\frac{3}{10}(=\frac{7}{10})$ oe or $\frac{3}{10}\times 400\ (=120)$ oe | | 2 | M1 or use of $\frac{7}{10}$ eg $\frac{400}{10}\times 7$ |
| | | | 280 | | A1 Cao |
| | | | | | **Total 7 marks** |

| | | | | | |
|---|---|---|---|---|---|
| **2** | (a) | | **C**, **E** | 1 | B1 accept **E** and **C** as order does not matter |
| | (b) | | **A**, **F** | 1 | B1 accept **F** and **A** as order does not matter |
| | (c) |  | Correct line | 1 | B1 correct line with no other lines |
| | (d) | | 12 | 1 | B1 |
| | (e) | | 8 | 1 | B1 |
| | | | | | **Total 5 marks** |

| | | | | | | |
|---|---|---|---|---|---|---|
| **5** | (a)(i) | | 27 | 1 | B1 | |
| | (ii) | | Add 5 | 1 | B1 | accept +5 or use of $5n+2$ |
| | (b) | | No and reason | 1 | B1 | e.g. 'because the unit digit of 256 is not 2 or 7' or it is not in the form $5n+2$ |
| | | | | | | **Total 3 marks** |

| | | | | | | |
|---|---|---|---|---|---|---|
| **6** | (a) | | 0.4, 0.407, 0.47, 0.477, 0.74 | 1 | B1 | |
| | (b) | | $\frac{7}{10}$ | 1 | B1 | oe |
| | (c) | | | 2 | M1 | for $\frac{30}{48}$ oe |
| | | | $\frac{5}{8}$ | | A1 | |
| | (d) | | 0.23 | 1 | B1 | |
| | (e) | $1-\left(\frac{1}{2}+\frac{2}{5}\right)\left(=\frac{1}{10}\right)$ oe | | 3 | M1 | for a method to find the remaining fraction of beads |
| | | 3 × "10" **or** $3\div"\frac{1}{10}"$ oe | | | M1 | |
| | | | 30 | | A1 | |
| | | | | | | **Total 8 marks** |

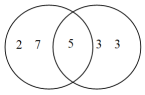
| | | | | |
|---|---|---|---|---|
| **11** | 0.23 × 450 oe | | 2 | M1 or for an answer of 553.5 or 346.5 |
| | | 103.5 | | A1 |
| | | | | **Total 2 marks** |

| | | | | | |
|---|---|---|---|---|---|
| **12** | a | | 1, 3, 9 | 1 | B1 need all three but ignore any repeats |
| | b | 15, 30, 45, 60, 75, 90, 105, 120, 135, 150, 165, 180, 195, 210 **and** 70, 140, 210<br>**OR** 3 × 5 **and** 2 × 5 × 7<br>**OR** 2 × 3 × 5 × 7 (2, 3, 5, 7) oe eg 3 × 5 × 14 (3, 5, 14)<br>3 \| 15 \| 70<br>5 \| 5 \| 70<br>7 \| 1 \| 14<br>2 \| 1 \| 2<br>1 \| 1<br>5 \| 15 \| 70<br>3 \| 3 \| 14<br>14 \| 1 \| 14<br>1 \| 1 | | 2 | M1 for listing at least three multiples of 15 and 70 **or** finding the prime factors of 15 and 70 (could be factors at the ends of branches of factor trees or lists 3, 5 and 2, 5, 7) or a correct calculation or the correct values for the LCM eg 2,3,5,7 or 3,5,14 oe (could be in a table) |
| | | | 210 | | A1 |
| | | | | | **Total 3 marks** |

| | | | | | |
|---|---|---|---|---|---|
| **13** | $\frac{49}{175}\times 100$ oe or 0.28 × 100 oe | | 2 | M1 | |
| | *Correct answer scores full marks (unless from obvious incorrect working)* | 28 | | A1 | |
| | | | | | **Total 2 marks** |

| | | | | | |
|---|---|---|---|---|---|
| **14** | 135 ÷ (2 + 7) (= 15) oe **or**<br>135 ÷ 9 (= 15) oe **or**<br>9 × 15 (= 135) oe | | 4 | M1 | M2 for<br>$\frac{2}{9}\times 135 (=30)$ or<br>$\frac{7}{9}\times 135 (=105)$ |
| | 2 × "15" (= 30) oe **or**<br>7 × "15" (= 105) oe | | | M1 | |
| | "30" × 8 + "105" × 5 (= 765) oe **or**<br>240 + 525 (= 765) oe | | | M1 | |
| | *Correct answer scores full marks (unless from obvious incorrect working)* | 65 | | A1 | |
| | | | | | **Total 4 marks** |

| | | | | |
|---|---|---|---|---|
| **15** | eg<br>119 ÷ 140 (× 100) or 0.85 (× 100) or<br>$\frac{17}{20}$ (× 100) oe | | 2 | M1 |
| | *Correct answer scores full marks (unless from obvious incorrect working)* | 85 | | A1 |
| | | | | **Total 2 marks** |

| | | | | |
|---|---|---|---|---|
| **16** | 45, 90, 135, 180... **and** 70, 140, 210, 280...<br>**or** 2, 5, 7 **and** 3,3,5<br>**or**<br>  <br><br>**or** $\frac{45\times70}{5}$ **or** 2, 3, 3, 5, 7 oe<br>**or**<br>5 \| 45 \| 70<br>9 \| 14<br>**or** 5, 9, 14 oe | | 2 | M1 for any correct valid method eg<br>for starting to list at least **four** multiples of each number<br>**or** 2, 5, 7 and 3, 3, 5 seen (may be in a factor tree, ignore 1)<br>**or** a fully correct Venn diagram<br>**or** 5, 9, 14 oe (could be in a table) |
| | *Correct answer scores full marks (unless from obvious incorrect working)* | 630 | | A1 Allow $2 \times 3^2 \times 5 \times 7$ oe<br>eg $5 \times 9 \times 14$ |
| | | | | **Total 2 marks** |

| | | | | |
|---|---|---|---|---|
| **17** | | 142.75 | 1 | B1 |
| | | 142.85 | 1 | B1 accept 142.8499... or $142.84\dot{9}$ |
| | | | | **Total 2 marks** |

| Question | | Working | Answer | Mark | Notes |
|---|---|---|---|---|---|
| **16** | | 0.5 × 6 × 6 × 5 (= 90)<br>0.5 × $\pi$ × 3² × 5 (=22.5$\pi$ = 70.6858...) or<br>$\pi$ × 3² × 5 (=45$\pi$ = 141.37166...)<br>'90' – '70.6858.....' | 19.3 | 4 | M1 Correct method for volume of **A**<br>M1 Correct method for volume of **B** or correct volume of cylinder<br>M1 Correct method to find the difference in the volume<br>A1 19 – 19.4 |
| **17** | (a) | | 6$n$ + 4 | 2 | M1 for 6$n$ + $k$ ($k$ may be 0 or absent) oe<br>A1 oe eg 10 + ($n$ – 1)6 or $n$ × 6 + 4 |
| | (b) | ...40, 46,...<br>−2, 1, 6, 13, 22, 33 46 ...<br><br>6$n$ + 4 = $n^2$ − 3 oe | e.g. 22 or 46 | 2 | M1 continuing sequence and writing at least 5 terms of 2nd sequence – allow one error or<br>for a correct equation ft part (a)<br>A1 or other number in both sequences eg −2 |
| **18** | | 0.07 × 10 800 (= 756) oe<br>10 800 + '756' | 11 556 | 3 | M1<br>M1 M2 for 1.07 × 10 800 oe<br>A1 |
| **19** | (a) | | 2, 4, 6, 8, 10, 12 | 1 | B1 |
| | (b) | | 8, 10, 12 | 1 | B1 |
| | (c) | | 1, 3, 5 | 1 | B1 |
| | (d) | | $\frac{9}{12}$ | 2 | M1 for 9 or $\frac{m}{12}$ ($m$ < 12)<br>A1 oe |

| Question | Working | Answer | Mark | Notes |
|---|---|---|---|---|
| **23** | 360 ÷ 8 (= 45 ) or 180 – (360 ÷ 8) (= 135)<br>or $\frac{6\times180}{8}$ (=135) oe<br>e.g. $\frac{540-112-112-84}{2}$ (=116) or<br>$\frac{540-308}{2}$ (= 116) or $\frac{232}{2}$ (= 116)<br>e.g. '135' – '116' or 180 – '116' – '45' | 19 | 4 | M1 Correct method to find the interior or exterior angle of octagon<br>M1 Correct method to find a missing angle from pentagon<br>M1 Complete method<br>A1 |
| **24** | 1 + 0.65 + 1.22 (=2.87) or<br>100 + 65 + 122 (=287)<br>861 ÷ 2.87 or<br>(861 ÷ 287) × 100 oe | 300 | 3 | M1 oe<br>Note: 863÷3=287 is M0<br>M1<br>A1 |
| **25** (a) | | $4d^2e(3+4e)$ | 2 | B2 B1 for correct partial factorisation with at least one correct factor |
| (b) | | $3k^3m$ | 2 | B2 B1 for an answer in the form $ak^xm^y$ with 2 correct from $a = 3$, $x = 3$, $y = 1$ |

| | | | | | |
|---|---|---|---|---|---|
| **21** | 20.40 ÷ (1 – 0.15) | | | M2 | for a complete method eg 20.40 ÷ (1 – 0.15)<br><br>for 20.40 ÷ (100 – 15) (= 0.24) |
| | | | | (M1) | **or** e.g. $0.85x = 20.40$ |
| | | 24 | 3 | A1 | |
| | | | | | **Total 3 marks** |

| | | | | | |
|---|---|---|---|---|---|
| **22** | 28 × 5 (= 140) **OR** 26.5 × 2 (= 53) | | | M1 | or 87 |
| | (28 × 5 − 26.5 × 2) ÷ (5 – 2) | | | M1 | for a complete method |
| | | 29 | 3 | A1 | |
| | | | | | **Total 3 marks** |

| | | | | | |
|---|---|---|---|---|---|
| **23** | 1.5 × 2 × 8 (= 24 ($cm^3$)) | | | M1 | for finding the volume of the cuboid |
| | e.g. $(V =) \frac{5.73\times1000}{19.32}$ (= 296.58...)<br>**or**<br>($M =$) 19.32 × "24" (= 463.68) | | | M2 | complete method to find the volume of statue **or** the mass of one block, could work in g or kg<br>(if not M2 then award M1 for correct use of density formula e.g. $19.32 = \frac{5.73\times1000}{V}$ **or** $19.32 = \frac{M}{"24"}$) |
| | e.g. "296.58" ÷ "24" (= 12.3576...) **or** "5730" ÷ "463.68" (= 12.3576...) | | | M1 | could work in g or kg |
| | | 13 | 5 | A1 | cao |
| | | | | | **Total 5 marks** |

| | | | | |
|---|---|---|---|---|
| **12** | $\frac{7.5}{100}\times 120$ (= 9) or 1.075 ×120 (=129) or<br>120 × 12 × 0.075 (108) | | 3 | M1 |
| | (120 + '9') × 12 or "129" × 12<br>120 × 12 × 0.075 + 120 × 12 oe eg 108 + 1440 | | | M1 |
| | | 1548 | | A1 |
| | | | | ***Total 3 marks*** |

| | | | | | |
|---|---|---|---|---|---|
| **13** | (a) | | $5x - x^2$ | 1 | B1 |
| | (b) | | $3(y - 7)$ | 1 | B1 |
| | (c) | $f + d = 3p$ **or** $\frac{f}{3} = p - \frac{d}{3}$ | | 2 | M1 A correct first stage in a correct formula |
| | | | $p = \frac{f+d}{3}$ | | A1 for $p = \frac{f+d}{3}$ (must see p =… at some stage)<br>(SCB1 for $p = \frac{f-d}{3}$) |
| | (d) | | $T = 10m + 6n$ | 3 | B3 for $T = 10m + 6n$ oe |
| | | | | | (B2 for $10m + 6n$ or $T = 10m + an$ or $T = bm + 6n$ or $T = 6m + 10n$) |
| | | | | | (B1 for $10m + an$ or $bm + 6n$ or $6m + 10n$) or for $T$ = an incorrect expression in $m$ and $n$ |
| | | | | | ***Total 7 marks*** |

| | | | | | |
|---|---|---|---|---|---|
| **21** | (10 – 2) × 180 oe (= 1440) **or**<br>(6 – 2) × 180 oe (= 720) | | 4 | M1 | for a method to find the sum of the interior angles of a decagon or a hexagon |
| | '1440' – 148 – 2×150 – 2×168 – 2×134 – 2×125 (=138) **or**<br>'1440' – 1302 (= 138) **or**<br>'720' – 148÷2 – 150 – 168 – 134 – 125 (= 69) **or**<br>'720' – 651 (= 69) | | | M1 | Allow omission of one angle |
| | 360 – '138' **or** 360 – 2 × '69' | | | M1 | |
| | | 222 | | A1 | |
| | | | | | |
| | **Alternative method (exterior angles)** | | | | |
| | 360 – 2×(180 – 125) – 2×(180 – 134) – 2×(180 – 168) – 2×(180 – 150) – (180 – 148)<br>**or**<br>360 – 2×55 – 2×46 – 2×12 – 2×30 – 32 | | 4 | M2 | If not M2 then award M1 for at least 3 or (180 – 125) , (180 – 134) , (180 – 168) , (180 – 150), (180 – 148) **or**<br>at least 3 of 55, 46, 12, 30, 32 |
| | 180 + '42' | | | M1 | |
| | | 222 | | A1 | |
| | | | | | **Total 4 marks** |

| | | | | |
|---|---|---|---|---|
| **22** | E.g. 1 − 0.2 (= 0.8) **or**<br>100(%) − 20(%) (= 80(%)) **or**<br>$\frac{1080}{80}$ (= 13.5) oe | | 3 | M1 |
| | E.g. 1080 ÷ 0.8 or<br>1080 ÷ 80 × 100 or '13.5' × 100<br>1080 × 100 ÷ 80 | | | M1 for a complete method |
| | | 1350 | | A1 |
| | | | | **Total 3 marks** |

| | | | | |
|---|---|---|---|---|
| **13** | 0.32 × 450 (= 144) oe **or** $\frac{2}{5}\times 375$ (= 150) oe | | 3 | M1 |
| | 0.32 × 450 (= 144) oe **and** $\frac{2}{5}\times 375$ (= 150) oe | | | M1 |
| | | 144 **and** 150 **and** $\frac{2}{5}$ of 375 | | A1 |
| | | | | **Total 3 marks** |

| | | | | |
|---|---|---|---|---|
| **14** | 2, 2, 5 and 5, 7 or seen on a ladder or at the end of branches<br>**OR** for at least 3 multiples of both 20 and 35<br>e.g. 20, 40, 60, ... and 35, 70, 105, ... | | 2 | M1 |
| | | 140 | | A1 allow 2 × 2 × 5 × 7 oe |
| | | | | **Total 2 marks** |

| | | | | |
|---|---|---|---|---|
| **15** | $\pi \times 15^2$ (= 225$\pi$) | | 2 | M1 |
| | | 707 | | A1 awrt 707 |
| | | | | **Total 2 marks** |

| | | | | | |
|---|---|---|---|---|---|
| **16** | (a) | | 47 | 1 | B1 Answer in range 46.5 – 47.5 |
| | (b) | A correct method to convert either dirham to euros<br>**or** euros to dirham<br>e.g. 400 Dirham = 2 × 200 Dirham = 2 × "47" (= 94) euros<br>**or** 90 euros = 30 + 60 = 127.5 +255 = 382.5 Dirham | | 2 | M1 |
| | | | France with correct calculations | | A1 |
| | | | | | **Total 3 marks** |

| | | | | | | |
|---|---|---|---|---|---|---|
| **17** | $x \times 1.05 = 1.26$ oe<br>eg $(x =)\ 1.26 \div 1.05\ (= 1.2)$ | or $30 \times 1.26$ (= 37.80) | or $30 \div 1.05$ (= 28.57) | | 3 | M1 |
| | 30 ×"1.2" | "37.80" ÷ 1.05 | "28.57…" × 1.26 | | | M1 |
| | | | | 36 | | A1 cao<br>If no marks awarded, SC B1 for one operation used correctly, even with another incorrect operation.<br>eg $1.26 \times 0.95 \times 30$ oe<br>or $1.26 \times 1.05 \times 30$ oe<br>or $1.26 \div 0.95 \times 30$ oe |
| | | | | | | **Total 3 marks** |

| | | | | | |
|---|---|---|---|---|---|
| **18** | | $y \geq 1$ oe<br>$x \leq 3$ oe<br>$y \leq 3x - 2$ | 3 | B1<br>B1<br>B1 | Condone < and > in place of ≤ and ≥ throughout.<br><br>SC B1 if no marks awarded, recognition of lines $x = 3$ and $y = 1$.<br>Allow incorrect inequality and condone use of equals signs<br>eg $y < 1$, $x = 3$<br>may be seen on diagram. |
| | | | | | **Total 3 marks** |

| | | | | |
|---|---|---|---|---|
| **20** | 0.22$x$ = 5.48 oe or<br>(1% =) 5.48 ÷ 22 (= 0.24909…) or<br>100 ÷ 22 (= 4.54…) | | | M1 |
| | ($x$ =) 5.48 ÷ 0.22 oe or<br>(100% =) 5.48 ÷ 22 × 100 or<br>"0.24909…" × 100 or<br>5.48 × "4.54…" | | | M1 |
| | *Correct answer scores full marks (unless from obvious incorrect working)* | 24.9 | | A1 awrt 24.9 |
| | | | | **Total 3 marks** |

| | | | | |
|---|---|---|---|---|
| **20**<br>**ALT**<br>**1** | 0.22$x$ = 5 480 000 oe or<br>(1% =) 5 480 000 ÷ 22 (= 249 090.9091…) or<br>100 ÷ 22 (= 4.54…) | | | M1 |
| | 5 480 000 ÷ "0.22" oe or<br>(100% =) 5 480 000 ÷ 22 × 100 or<br>"249 090.9091…"× 100 or<br>5 480 000 × "4.54…" | | | M1 |
| | *Correct answer scores full marks (unless from obvious incorrect working)* | 24 900 000 | | A1 awrt 24 900 000 |
| | | | | **Total 3 marks** |

| | | | | |
|---|---|---|---|---|
| **22** | 12 × 2.45 (= 29.4) **or** 21 ÷ 12 (= 1.75) | | 3 | M1 |
| | $\frac{'29.4'-21}{21}\times 100$ oe **or**<br>$\frac{2.45-'1.75'}{'1.75'}\times 100$ oe **or**<br>$(\frac{'29.4'-21}{12}) \div '1.75' \times 100$ oe **or**<br>$(\frac{2.45}{'1.75'}\times 100)-100$ oe | | | M1 or an answer of 140(%) |
| | *Correct answer scores full marks (unless from obvious incorrect working)* | 40 | | A1 |
| | | | | **Total 3 marks** |

| | | | | |
|---|---|---|---|---|
| **10** | 12 × 11.75 (= 141) | | 3 | M1 |
| | (181 – '141') ÷ 5 | | | M1 |
| | | 8(.00) | | A1 |
| | | | | **Total 3 marks** |

| | | | | |
|---|---|---|---|---|
| **11** | | TV, TB, TT,<br>NV, NB, NT,<br>HV, HB, HT | 2 | B2 for all combinations with no repeats or incorrect combinations<br><br>If not B2 then award B1 for at least 4 correct combinations (ignore repeats or incorrect combinations) |
| | | | | **Total 2 marks** |

| | | | | |
|---|---|---|---|---|
| **12** | $175+175+175+330\,(=855)$ or $\frac{330}{'855'}$ | | 3 | M1 |
| | $\frac{330}{175+175+175+330}\times 100$ or $\frac{330}{'855'}\times 100$ | | | M1 |
| | | 38.6 | | A1 Answers in range 38.59 to 38.6 |
| | | | | **Total 3 marks** |

| | | | | |
|---|---|---|---|---|
| **25** | 1 + 0.12 (= 1.12) or<br><br>100(%) + 12(%) (=112(%)) or<br><br>$\frac{18.20}{112}\left(=\frac{13}{80}=0.1625\right)$ or<br><br>$x + 0.12x = 18.2(0)$ or $x \times 1.12 = 18.2(0)$ | | | M1 |
| | eg $18.2(0) \div (1 + 0.12)$ oe or<br><br>$\frac{18.2(0)}{112} \times 100$ oe | | | M1 for a complete method |
| | | 16.25 | | A1 |
| | | | | **Total 3 marks** |

| | | | | |
|---|---|---|---|---|
| **19** | 1 + 0.15 (= 1.15) **or** $x$ + 0.15$x$ = 943 **or**<br>100(%) + 15(%) (= 115(%)) **or**<br>$\frac{943}{115}$ (= 8.2) oe | | 3 | M1 |
| | 943 ÷ "1.15" **or**<br>943 ÷ "115" × 100 **or**<br>943 × 100 ÷ "115" oe **or**<br>8.2 × 100 | | | M1 dep on M1 |
| | *Working not required, so correct answer scores full marks (unless from obvious incorrect working)* | 820 | | A1 |
| | | | | **Total 3 marks** |

| | | | | |
|---|---|---|---|---|
| **20** | (5 – 2) × 180 (= 540)<br>**or**<br>360 ÷ 5 (= 72) | | 4 | M1<br>NB If angles are on the diagram they must be from correct working and correctly assigned |
| | $\frac{"540"}{5}$ (= 108) or 180 – "72" (= 108)<br>**or**<br>180 – 96 (= 84) | | | M1 |
| | "72" + "84"<br>**or**<br>360 – (96 + "108")<br>**or**<br>180 – ("108" – "84") | | | M1 for a complete method |
| | *Working required* | 156 | | A1 dep on M2 |
| | | | | **Total 4 marks** |

| | | | | |
|---|---|---|---|---|
| **23** | eg<br>$3^3$ or $\left(3^{-2}\right)\times3^{-5}$ or $\frac{3^3}{\left(3^{10}\right)}$ or $\frac{\left(3^5\right)}{3^{12}}$ or $\frac{\left(3^{-2}\right)}{3^5}$ or $3^{-12}\left(\times3^5\right)$oe<br>or<br>– 2 + 5 – 10 oe or<br>– 12 + 5 oe or<br>3 – 10 oe | | 2 | M1 for a correct application of an index rule as a first step<br>or<br>a correct calculation for *n* |
| | *Working not required, so correct answer scores full marks (unless from obvious incorrect working)* | –7 | | A1 Allow $3^{-7}$ |
| | | | | **Total 2 marks** |

| | | | | |
|---|---|---|---|---|
| **24** | 1 – 0.17 or 0.83 or $\frac{83}{100}$ **or**<br>100(%) – 17(%) or 83(%) **or**<br>$\frac{6225}{83}$ (= 75) oe | | 3 | M1 |
| | 6225 ÷ "0.83" **or**<br>6225 ÷ "83" × 100 **or**<br>6225 × 100 ÷ "83" oe **or**<br>75 × 100 | | | M1 |
| | *Working not required, so correct answer scores full marks (unless from obvious incorrect working)* | 7500 | | A1 |
| | | | | **Total 3 marks** |

| | | | | |
|---|---|---|---|---|
| **22** | eg $1 - 0.28$ (= 0.72) oe **or** $0.72x = 198$<br>**or** 100(%) − 28(%) (= 72(%))<br>**or** $\frac{198}{72}$ (= 2.75) oe | | 3 | M1 for a correct first step |
| | eg ($x$ =) 198 ÷ "0.72" oe<br>**or** 198 ÷ "72" × 100 oe<br>**or** "2.75" × 100 | | | M1 for a complete method |
| | *Correct answer scores full marks (unless from obvious incorrect working)* | 275 | | A1 cao |
| | | | | **Total 3 marks** |

| Question | Working | Answer | Mark | Notes |
|---|---|---|---|---|
| **13** | 7.79 or 11.709…. or<br>0.67 or 0.665 or 0.6652 | | 2 | M1 |
| | *Working not required, so correct answer scores full marks (unless from obvious incorrect working)* | 0.66524(4…) | | A1 At least 5 sf<br>(0.665 244 513 4 calculator value) |
| | | | | **Total 2 marks** |

| Question | Working | Answer | Mark | Notes |
|---|---|---|---|---|
| **14** | 125 × 9 (= 1125) or 125 × 5 (= 625) or<br>9 × 5 (= 45) or 125 × 9 × 5 (= 5625) or<br>0.24 × 125 (= 30) or<br>0.24 × 9 (= 2.16) or<br>0.24 × 5 (= 1.2) | | 3 | M1 |
| | 0.24 × (125 × 9 × 5) oe or<br>0.24 × "5625" oe or<br>"30" × 9 × 5 oe or<br>125 × "2.16" × 5 oe or<br>125 × 9 × "1.2" oe | | | M1 for a complete method |
| | *Working not required, so correct answer scores full marks (unless from obvious incorrect working)* | 1350 | | A1 SCB2 for 4275 |
| | | | | **Total 3 marks** |

| Question | Working | Answer | Mark | Notes |
|---|---|---|---|---|
| **15** | 2 × $\pi$ × 16<br>or<br>$\pi$ × "32" | | 2 | M1 Allow 3.14… or $\frac{22}{7}$ for $\pi$ |
| | *Working not required, so correct answer scores full marks (unless from obvious incorrect working)* | 101 | | A1 100 to 101<br><br>NB 101 from $\pi \times 16^2$ (= 32$\pi$) scores M0A0 |
| | | | | **Total 2 marks** |

| Question | Working | Answer | Mark | Notes | |
|---|---|---|---|---|---|
| **24*** | 0.07 × 4000 (= 280) **or**<br>1.07 × 4000 ( = 4280) | | 3 | M1 for finding 7% of 4000 or 107% of 4000 | M2 for $1.07^3 \times 4000$ or $1.07^4 \times 4000$ ( = 5243….) |
| | 4000 + "280" (= 4280) oe **and**<br>0.07 × "4280" ( = 299.6) **and**<br>"4280" + "299.6" (= 4579.6) **and**<br>0.07 × "4579.6" (= 320.572)<br>**or**<br>"280" + "299.6" + "320.572" (= 900(.172)) | | | M1 | |
| | *Working not required, so correct answer scores full marks (unless from obvious incorrect working)* | 4900 | | A1 allow answers in the range 4900 – 4901<br><br>If no other mark awarded,<br>SCB1 for<br>4000 × 0.07 × 3 (= 840) or<br>4000 × 0.21 (= 840) or<br>4000 + 4000 × 0.07 × 3 (= 4840) or<br>4000 × 1.21 (= 4840) or<br>0.93 × 4000 (= 3720) or<br>0.79 × 4000 (= 3160) or<br>$0.93^3 \times 4000$ (= 3217…) or<br>$4000 \times 1.07^2$ (= 4579…) | |
| | | | | | **Total 3 marks** |

| | | | | | | |
|---|---|---|---|---|---|---|
| **25** | | 1 – 0.15 (= 0.85)<br>**or**<br>100(%) – 15(%) (= 85(%))<br>**or**<br>$\frac{612}{85}$ (= 7.2) oe | | 3 | M1 | may be seen embedded<br><br>Do not allow (1 – 15%) unless processed correctly |
| | | 612 ÷ "0.85" oe<br>**or**<br>612 ÷ "85" × 100 oe<br>**or**<br>"7.2" × 100 | | | M1 | for a complete method |
| | | *Correct answer scores full marks (unless from obvious incorrect working)* | 720 | | A1 | |
| | | | | | | **Total 3 marks** |

| | | | | | | |
|---|---|---|---|---|---|---|
| **26** | | eg $y = -5x$ (+ $k$) **or** $y - a = -5(x - b)$<br>**or**<br>eg $y = mx + 6$ **or** $y - 6 = m(x - 0)$<br>**or**<br>eg $-5x + 6$ **or** **L** $= -5x + 6$ | | 2 | M1 | for the equation of any line with gradient −5 other than $y = 2 - 5x$<br>**or**<br>for the equation of any line passing through the point (0, 6)<br>**or**<br>the correct line missing '$y =$' or with the wrong subject |
| | | *Correct answer scores full marks (unless from obvious incorrect working)* | $y = -5x + 6$ | | A1 | oe equation eg $y = 6 - 5x$ **or** $y - 6 = -5(x - 0)$ **or** $y + 5x = 6$ |
| | | | | | | **Total 2 marks** |

| Question | Working | Answer | Mark | Notes |
|---|---|---|---|---|
| 16 | $\frac{3450}{2+6+7}$ (=230) **or** $\frac{2}{2+6+7}\times 3450(=460)$ **or** $\frac{7}{2+6+7}\times 3450(=1610)$ **or** $\frac{7-2}{2+6+7}$ $\left(=\frac{1}{3}\right)$ | | 3 | M1 |
| | (7 – 2) × "230" **or** 7 × "230" – 2 × "230" **or** "1610" – "460" **or** $"\frac{1}{3}"\times 3450$ | | | M1 dep |
| | | 1150 | | A1 |
| | | | | **Total 3 marks** |

| | | | | | |
|---|---|---|---|---|---|
| 17 | $\frac{8}{100}\times 20000$ (=1600) | | 4 | M1oe | Award M2 for $20000\times 1.08$ or 21600 |
| | $20000+\frac{8}{100}\times 20000$ (=21600) **or** (20 000 – 19200) + $\frac{8}{100}\times 20000$ (=2400) | | | M1 | |
| | $\frac{"21600"-19200}{19200}(\times 100)$ **or** $\frac{"2400"}{19200}(\times 100)$ **or** "21600" ÷ 19200 (×100) oe | | | M1 | or for 1.125 or $\frac{9}{8}$ or 112.5% |
| | | 12.5 | | A1 | oe |
| | | | | | **Total 4 marks** |

| Question | Working | Answer | Mark | Notes |
|---|---|---|---|---|
| **17** | (area =) 2 × 1.25 (=2.5) | | 3 | M1 |
| | (*F* = ) 42 × "2.5" or 42 = $\frac{F}{\text{"2.5"}}$ | | | M1 Correct substitution into pressure formula |
| | | 105 | | A1 cao |
| | | | | **Total 3 marks** |

| | | | | |
|---|---|---|---|---|
| **18** | eg (6.3 × 1000) ÷ 210 (= 30) | | 4 | M1 for a method to find the number of candles, could work in grams or kg |
| | $\frac{2}{5}\times\text{"30"}\times 13\,(=156)$ | | | M1 for a method to find money made from the \$13 candles |
| | $\left(1-\frac{2}{5}\right)\times\text{"30"}\times 0.8\times 13\,(=187.20)$ | | | M1 for a method to find money made from the reduced candles |
| | | 343.2(0) | | A1 |
| | | | | **Total 4 marks** |

| Question | | Working | Answer | Mark | Notes |
|---|---|---|---|---|---|
| 7 | | $\frac{60}{100}\times 53.50$ ( = 32.1(0)) **or** $\frac{60}{100}\times 53.50\times 2$ ( = 64.2(0))<br><br>2 × 53.50 + 2 × "32.10" (= 171.2(0)) **or** 2 × 53.50 + "64.20" (= 171.2(0))<br><br>200 – "171.20" | 28.8(0) | 4 | M1 oe<br><br>M1<br><br>M1<br><br>A1 |
| 8 | (a) | | $4x + 3y$ | 2 | B2 (B1 for $4x$ or $+ 3y$) |
| | (b) | $2t = 12 - 3$ | 4.5 | 2 | M1 or for $t + \frac{3}{2} = \frac{12}{2}$<br>A1 oe |
| 9 | (a) | | Pattern | 1 | B1 |
| | (b) | | 13 | 1 | B1 |
| | (c) | | 15 | 1 | B1 |
| | (d) | 3 + 49 ×2 **or** 2$n$ + 1 **or** 2 × 50 + 1 | 101 | 2 | M1<br>A1 |

| Question | Working | Answer | Mark | Notes |
|---|---|---|---|---|
| **13** | Angle BCD = 180 – 68 (=112) or<br>angle *BAD* (or *BDA* ) = (180 – 48) ÷ 2 (=66)<br>angle *BDC* = 360 – 243 – "66" (=51) **or**<br>angle *ADC* = 360 – 243 (=117)<br>e.g. 68 – "51" (=17) **or** 180 – (180 – 68) – "51" **or** 360 – "117" – "66" – (180 – 68) – 48 | 17 with reasons | 5 | M1 Could be seen on diagram<br>M1 Could be seen on diagram<br>M1 for a complete method<br>B1 dep on M1 for any one correct appropriate reason<br>A1 for correct answer with full reasons<br>E.g.<br>Base angles of an isosceles triangle are equal<br>Angles in a triangle sum to 180º<br>Angles at a point add up to 360º / full turn<br>Angles on a straight line sum to 180º **or** exterior angle equals the sum of interior opposite angles<br>Angles in a quadrilateral add up to 360º |
| **14** | 300 × 0.08 oe (=24) **or** 300 × 9.5 (=2850) **or** 100(%) – 8(%) (=92(%)) **or** 1 – 0.08 (=0.92)<br>300 – "24" (=276) **or** for 0.08 × "2850" (=228) **or** "0.92" × 300 (=276)<br>"276" × 9.5 **or** "2850" – "228" oe | 2622 | 4 | M1<br>M1 M2 for 0.92 ×"2850"<br>M1<br>A1 |

| Question | | Working | Answer | Mark | Notes |
|---|---|---|---|---|---|
| 11 | (a) | | 3720 | 1 | B1 |
| | (b) | | 95 | 1 | B1 |
| | (c) | $\frac{651}{9.3} \times 4.4$ | | 2 | M1 |
| | | | 308 | | A1 |
| | | | | | **Total 4 marks** |

| | | | | | | |
|---|---|---|---|---|---|---|
| 12 | (a) | | $4k$ | 1 | B1 | |
| | (b) (i) | | $9^4$ | 1 | B1 | |
| | (ii) | | $3^8$ | 1 | B1 | |
| | (c) | | $5^{19}$ | 1 | B1 | |
| | (d) | | | 2 | M1 | A factor tree / division ladder of 3 or more factors (≠1), multiplying to 800, which must include 2 and 5. Condone 1 error when product ≠ 800 |
| | | | 2×2×2×2×2×5×5 | | A1 | Dep on M1 oe eg $2^5 \times 5^2$ |

| | | | | | |
|---|---|---|---|---|---|
| 13 | 0.4 × 75(= 30) oe | | 4 | M1 | M2 for 0.6 × 75(= 45) oe |
| | 75 – 30 (= 45) | | | M1 | |
| | (T-Shirt =) $\frac{45-12}{2}$ or (Bag =) $\frac{45+12}{2}$ oe<br>or $t + (t + 12) = 45$ oe | | | M1 | (T-shirt = $16.50) |
| | | 28.5(0) | | A1 | |
| | | | | | **Total 4 marks** |

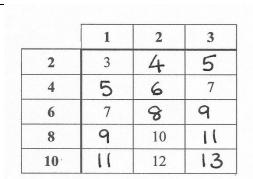
| | | | | | |
|---|---|---|---|---|---|
| **12** | E.g.<br>(72 ÷ 3) × 1.34 (= 17.91) **or**<br>34.5 × 1.34 (= 46.23) **or**<br>72 ÷ 1.34 (= 53.73) **or**<br>(34.5 × 3) × 1.34 (= 138.69) | | 4 | M1 | for converting £ to $ or $ to £ |
| | 34.5 – '17.91' (= 16.59) **or**<br>'46.23' – (72 ÷ 3) = (22.23) **or**<br>(34.5 × 3) – '53.73' (= 49.77) **or**<br>'138.69' – 72 (= 66.69) | | | M1 | for profit of 1 pair of jeans or 3 pairs of jeans |
| | $\frac{'16.59'}{'17.91'}\times 100$ **or** $\frac{'22.23'}{72\div 3}\times 100$ **or**<br>$\frac{'49.77'}{'53.73'}\times 100$ **or** $\frac{'66.69'}{72}\times 100$ | | | M1 | for a complete method |
| | | 93 | | A1 | for 92.625 – 93 |
| | | | | | **Total 4 marks** |

| | | | | | | |
|---|---|---|---|---|---|---|
| **7** | (a) | | $2c + 7d$ | 2 | B2 | (B1 for $2c$ or $7d$) |
| | (b) | | $40ef$ | 1 | B1 | |
| | (c) | $5r = 8 + 3$ or $5r = 11$ or $-3 - 8 = -5r$ or $-11 = -5r$ or $r - \frac{3}{5} = \frac{8}{5}$ or $(8 + 3) \div 5$ | | 2 | M1 | for a correct first step or for a calculation for $r$ |
| | | | 2.2 | | A1 | oe |
| | | | | | | **Total 5 marks** |

| | | | | | | |
|---|---|---|---|---|---|---|
| **8** | (a) | ($DBC$ =) 180 – (93 + 42) (= 45) **OR** ($x$ =) 93 + 42 | | 2 | M1 | for method to find angle $DBC$ **OR** using exterior angle is equal to the sum of the two opposite interior angles |
| | | | 135 | | A1 | |
| | (b)(i) | 360 – (90 + 100 + 114) oe | | 2 | M1 | for a complete method to find $y$ |
| | | | 56 | | A1 | |
| | (ii) | | Angles at a point sum to 360° | 1 | B1 | |
| | | | | | | **Total 5 marks** |

| | | | | | |
|---|---|---|---|---|---|
| **9** | 0.4 × 2500 (1000) **or** 0.6 × 2500 (= 1500) oe | | 4 | M1 | for finding 40% or 60% of 2500 |
| | 2500 – "1000" – 300 (= 1200) oe **or** "1500" – 300 (= 1200) oe | | | M1 | for method to find the remaining money |
| | "1200" ÷ (3 + 7) × 7 oe | | | M1 | for method to find the amount of money spent on food |
| | | 840 | | A1 | |
| | | | | | **Total 4 marks** |

| | | | | | |
|---|---|---|---|---|---|
| **20** | eg $0.45 \times 180$ (= 81) oe<br><br>**OR** $\frac{15}{180}\left(=\frac{1}{12}\text{ or }0.0833...\right)$<br><br>**OR** $\frac{15}{180}\times 100\left(=8.3(33...)\%\right)$ | | 4 | M1 | for a method to find the number of students studying German<br><br>**OR** the number of students studying French as a fraction or decimal of the total students<br><br>**OR** a method to find the percentage of students studying French<br><br>81 may be seen as part of an equation |
| | eg 180 – 15 – "81" (= 84) **or** "81" + 15 (= 96)<br><br>**OR** $1-\left(\frac{1}{12}+\frac{45}{100}\right)=\left(\frac{7}{15}\text{ or }0.466...\right)$<br>**or** $\frac{1}{12}+\frac{45}{100}=\left(\frac{8}{15}\text{ or }0.533...\right)$<br><br>**OR** 100 – ("8.3" + 45) (= 46.6(66…) or 46.7%)<br>**or** "8.3" + 45 (= 53.3(33…) or 53.3%) | | | M1 | for a method to find the number of students studying Italian/Spanish **or** French/German<br><br>**OR** a method to find the fraction or decimal of students studying Italian/Spanish **or** French/German<br><br>**OR** a method to find the percentage of students studying Italian/Spanish **or** French/German<br><br>84 or 96 may be seen as part of an equation |
| | eg $\frac{"84"}{180-"84"}(\times 100)\left(=\frac{7}{8}\text{ or }0.875\right)$ **or** $\frac{"84"}{"96"}(\times 100)\left(=\frac{7}{8}\text{ or }0.875\right)$<br>**or** $"\frac{7}{15}"\div"\frac{8}{15}"\left(=\frac{7}{8}\text{ or }0.875\right)$ **or** $\frac{"46.6"}{"53.3"}(\times 100)(=0.872...)$ | | | M1 | for a complete method to find the fraction or decimal or percentage of Italian/Spanish to French/German |
| | | 87.5 | | A1 | accept 87.2 – 87.7 |
| | | | | | **Total 4 marks** |

| | | | | | | |
|---|---|---|---|---|---|---|
| **5** | (a) |  | | | 2 | B2 For all 10 entries correct in table (B1 for 6, 7, 8 or 9 correct entries) |
| | (b)(i) | | | $\frac{10}{15}$ | 1 | B1ft oe eg $\frac{2}{3}$ or 0.66, 0.67, 0.666, 0.667 etc |
| | (ii) | | | $\frac{8}{15}$ | 1 | B1ft 0.53(333…) (SC B1(marks in (ii)) if both parts using "correct values" but incorrect probability notation eg 10 : 15, 8 : 15) |
| | | | | | | **Total 4 marks** |

| | | | | | |
|---|---|---|---|---|---|
| **6** | 12 × 1.40 + 12 × 0.5 ×1.40 (=25.20) oe eg (1.4 + 0.7) × 12 (= 25.20) | | 4 | M1 | correct method to find the cost for offer A |
| | 0.8 × 7.20 × "4" (=23.04) oe<br>or<br>"4" × 7.20 – 0.2("4" × 7.20) oe eg 28.80 – 5.76 (= 23.04)<br>where 4 = 24 ÷ 6 | | | M1 | indep<br>correct method to find the cost for offer B |
| | 12 × 1.40 + 12 × 0.5 ×1.40 − 0.8 × 7.20 × 4 or "25.20" – "23.04" | | | M1 | dep on M2<br>A fully correct method to find the difference |
| | | 2.16 | | A1 | allow –2.16 |
| | | | | | **Total 4 marks** |

| | | | | | | |
|---|---|---|---|---|---|---|
| **18** | (a) | | $w^9$ | 1 | B1 | |
| | (b) | | $10m^7p^3$ | 2 | B2 | (B1 for 2 terms correct as part of a product) |
| | | | | | | **Total 3 marks** |

| | | | | | |
|---|---|---|---|---|---|
| **19** | $1600 \times 0.16$ (= 256) oe or $1 - 0.16$ (= 0.84) oe | | 4 | M1 | |
| | $1600 -$ "256" or $1600 \times$ "0.84" (= 1344) | | | M1 | |
| | $\frac{"1344"}{1400}(=0.96)$ **or** $\frac{1400-"1344"}{1400}(=0.04)$ **or** $\frac{"1344"}{1400}\times 100(=96)$ **or** $\frac{1400-"1344"}{1400}\times 100$ | | | M1 | |
| | *Correct answer scores full marks (unless from obvious incorrect working)* | 4 | | A1 | SCB1 for 1856 seen if no other marks awarded |
| | | | | | **Total 4 marks** |

| | | | | | | |
|---|---|---|---|---|---|---|
| **5** | (a) | | $4p$ | 1 | B1 | |
| | (b) | | $12e + 4f$ | 2 | B2 | B1 for $12e$ or $4f$ |
| | (c) | | 6 | 1 | B1 | cao |
| | (d) | $4y = 43 - 7$ oe **or** $\frac{4y}{4} + \frac{7}{4} = \frac{43}{4}$ oe **or** $(43 - 7) \div 4$ | | 2 | M1 | for a correct first step to solve the equation **or** a complete calculation for finding the value of $y$ |
| | | *Correct answer scores full marks (unless from obvious incorrect working)* | 9 | | A1 | |
| | | | | | | **Total 6 marks** |

| | | | | | | |
|---|---|---|---|---|---|---|
| **6** | (a) | $0.01 \times 750$ oe | | 2 | M1 | for a complete method |
| | | *Correct answer scores full marks (unless from obvious incorrect working)* | 7.5 | | A1 | oe eg $\frac{15}{2}$, $7\frac{1}{2}$ |
| | (b) | eg $(2000 \div 400) \times 125$ **or** $2000 \div (400 \div 125)$ | | 2 | M1 | for a complete method |
| | | *Correct answer scores full marks (unless from obvious incorrect working)* | 625 | | A1 | cao |
| | | | | | | **Total 4 marks** |

| | | | | |
|---|---|---|---|---|
| **18** | 0.7 × 60 × 22 (= 924) oe **or** (1 – 0.7) × 60 × 19 (= 342) oe<br>**OR** $0.7\times60\times\left(22-\frac{780}{60}\right)(=378)$ oe<br>**or** $(1-0.7)\times60\times\left(19-\frac{780}{60}\right)(=108)$ | | 4 | M1 for finding income for the 22 dirhams notebooks **or** the 19 dirhams notebooks<br>**OR** for finding the profit for the 22 dirhams notebooks **or** the 19 dirhams notebooks |
| | 0.7 × 60 × 22 (= 924) oe **and** (1 – 0.7) × 60 × 19 (= 342) oe<br>**OR** $0.7\times60\times\left(22-\frac{780}{60}\right)(=378)$ oe<br>**and** $(1-0.7)\times60\times\left(19-\frac{780}{60}\right)(=108)$ | | | M1 for finding income for the 22 dirhams notebooks **and** the 19 dirhams notebooks<br>**OR** for finding the profit for the 22 dirhams notebooks **and** the 19 dirhams notebooks,<br>1266 **or** 486 implies M2 |
| | eg $\frac{"924"+"342"-780}{780}\times100$ **or** $\frac{"924"+"342"}{780}\times100-100$<br>**or** $\frac{"378"+"108"}{780}\times100$ **or** $\frac{486}{780}\times100$ | | | M1 for a complete method to find percentage profit |
| | *Correct answer scores full marks (unless from obvious incorrect working)* | 62.3 | | A1 awrt 62.3, allow 62 from correct working |
| | | | | **Total 4 marks** |

| | | | | |
|---|---|---|---|---|
| **10** | $\frac{4}{5} \times 120$ (= 96) oe | | 4 | M1 |
| | "96" × 46 (= 4416) oe | | | M1 |
| | "4416" – 120 × 28 or<br>"4416" – "3360" | | | M1 |
| | *Correct answer scores full marks (unless from obvious incorrect working)* | 1056 | | A1 |
| | | | | **Total 4 marks** |

| | | | | | | |
|---|---|---|---|---|---|---|
| **11** | | **Seoul** | **Tokyo** | **Total** | correct table | 3 | B3 for all correct entries<br>(B2 for 6 or 7 or 8 correct entries)<br>(B1 for 3 or 4 or 5 correct entries) |
| | **Business** | 51 | 35 | 86 | | | |
| | **Economy** | 25 | 69 | 94 | | | |
| | **Total** | 76 | 104 | 180 | | | |
| | *Correct answer scores full marks (unless from obvious incorrect working)* | | | | | | **Total 3 marks** |

| | | | | | |
|---|---|---|---|---|---|
| **12** | (a) | [7.3 – 7.7] × 3 | | 2 | M1 |
| | | *Correct answer scores full marks (unless from obvious incorrect working)* | 22.5 | | A1 accept an answer in the range 21.9 – 23.1 |
| | (b) | for stating 8 cm **or**<br>within or on guidelines on overlay | | 1 | B1 |
| | | for × from B with a bearing of 110° **or**<br>× plotted within or on guidelines on overlay **or**<br>line drawn within or on guidelines | | 1 | B1 |
| | | | Correct position | 1 | B1 within or on guidelines |
| | | | | | **Total 5 marks** |

| | | | | |
|---|---|---|---|---|
| **17** | 1500 + (36 × 450) (= 17 700) | | 4 | M1 |
| | "17 700" – 12 500 (= 5200) oe<br>or $\frac{\text{"17 700"}}{12\,500}$ (=1.416) oe | | | M1 |
| | $\frac{\text{"5200"}}{12500}$ ( × 100) oe or 0.416 (× 100) or<br>("17 700" / 12 500) × 100 or 141.6 (– 100) | | | M1 |
| | *Working not required, so correct answer scores full marks (unless from obvious incorrect working)* | 41.6 | | A1 allow 42 from correct working |
| | | | | **Total 4 marks** |

| | | | | |
|---|---|---|---|---|
| **18** (a) | 1 – 0.58 (= 0.42) or 100 – 58 (= 42)<br>0.58 + 2*x* + *x* = 1 oe | | 2 | M1 |
| | *Working not required, so correct answer scores full marks (unless from obvious incorrect working)* | 0.14 | | A1 oe eg 14% (must have % sign) or $\frac{7}{50}$ etc<br>SCB1 for an answer of 14 if no other marks are awarded |
| (b) | 250 × 0.58 oe or<br>58 + 58 + (58 ÷ 2) oe | | 2 | M1 or for $\frac{145}{250}$ |
| | *Working not required, so correct answer scores full marks (unless from obvious incorrect working)* | 145 | | A1 cao |
| | | | | **Total 4 marks** |

| | | | | |
|---|---|---|---|---|
| **20** | eg<br>$1-\frac{1}{6}=\frac{5}{6}$ or<br>1 – 0.16(666…) (= 0.83(333…) oe or<br>100(%) – 16(.666…)(%) (= 83(.333…)(%)) oe<br>or<br>1 − 0.2 (= 0.8) oe or<br>100(%) − 20(%) (= 80(%)) | | 4 | M1<br>Allow eg<br>1 – 0.16 (= 0.84) (= 84(%))<br>1 – 0.17 (= 0.83) (= 83(%))<br>rounded or truncated |
| | 140 , "$\frac{5}{6}$" (= 168) oe or<br>140 ÷ "0.83(333…)" (= 168) oe eg 140 ÷ 83.33 × 100 (=168)<br>**or**<br>136 ÷ "0.8" (= 170) oe eg 136 ÷ 80 × 100 (= 170) | | | M1<br>Allow eg<br>140 ÷ "0.84" = 166(.666…)<br>140 ÷ "0.83" = 168(.674…)<br>rounded or truncated |
| | 140 , "$\frac{5}{6}$" (= 168) oe or<br>140 ÷ "0.83(333…)" (= 168) oe<br>**and**<br>136 ÷ "0.8" (= 170) oe | | | M1<br>Allow eg<br>140 ÷ "0.84" = 166(.666…)<br>140 ÷ "0.83" = 168(.674…)<br>rounded or truncated |
| | *Working not required, so correct answer scores full marks (unless from obvious incorrect working)* | 2 | | A1 Allow –2 |
| | | | | **Total 4 marks** |

| Question | Working | Answer | Mark | Notes |
|---|---|---|---|---|
| **13** | eg 0.1 × 150 (= 15) | | 4 | M1 M2 for 0.9 × 150 (= 135) |
| | 1800 + 360 (= 2160) oe eg 135$g$ – 1800 = 360<br>or<br>150 – "15" (= 135) | | | M1 "15" must come from correct working |
| | "2160" ÷ (150 – "15") or<br>"2160" ÷ "135" | | | M1 |
| | *Working not required, so correct answer scores full marks (unless from obvious incorrect working)* | 16 | | A1 |
| | | | | **Total 4 marks** |

| Question | Working | Answer | Mark | Notes |
|---|---|---|---|---|
| **14** | | | 2 | M1 For 35.74 or 3.80788…. or for the correct answer but rounded or truncated to 3, 4 or 5 significant figures (9.38, 9.39, 9.385, 9.386, 9.3857, 9.3858) |
| | *Working not required, so correct answer scores full marks (unless from obvious incorrect working)* | 9.38578(…) | | A1 Minimum 9.38578 |
| | | | | **Total 2 marks** |

| | | | | | |
|---|---|---|---|---|---|
| **15** (a) | | 12 | 1 | B1 | |
| (b) | eg<br>11 × 7 + 12 × 8 + 13 × 7 + 14 × 5 + 15 × 1 + 16 × 2 (= 381)<br>**or**<br>77 + 96 + 91 + 70 + 15 + 32 (= 381) | | 3 | M1 | for at least 4 correct products |
| | "381" ÷ 30 oe | | | M1 | |
| | *Working not required, so correct answer scores full marks (unless from obvious incorrect working)* | 12.7 | | A1 | oe, allow 13 if M2 scored |
| | | | | | **Total 4 marks** |

| | | | | |
|---|---|---|---|---|
| **16** | eg<br>375 × 8 oe or<br>3000 | | 4 | M1 |
| | eg<br>375 × 8 × 1.2 (= 3600) or<br>"3000" × $\left(1+\frac{20}{100}\right)$ (= 3600) oe or<br>1.2 × "3000" (= 3600) or<br>(0.2 × "3000") + 3000 (= 3600) or<br>600 + "3000" (= 3600) | | | M1 |
| | eg<br>"3600" ÷ 300 | | | M1 |
| | *Working not required, so correct answer scores full marks (unless from obvious incorrect working)* | 12 | | A1 |
| | | | | **Total 4 marks** |

| | | | | |
|---|---|---|---|---|
| **14** (a) | (3) (4) **5** **6**<br>**5** **6** (7) **8**<br>**7** **8** **9** (10) | For all correct values | 2 | B2 for all correct values<br>(B1 for 6 or 7 correct values) |
| (b) | | | 2 | M1 for $\frac{m}{12}$ where $m < 12$ or $\frac{11}{n}$<br>where $n > 11$ or for 11:12 |
| | *Correct answer scores full marks (unless from obvious incorrect working)* | $\frac{11}{12}$ | | A1 oe 0.91(666…) or 91(.666…)%<br>truncated or rounded |
| | | | | **Total 4 marks** |

| | | | | |
|---|---|---|---|---|
| **15** | 0.35 × 140 (= 49) oe or<br>14 + 14 + 14 + 7 (= 49) oe or<br>$\frac{1}{4}$ of 140 (= 35) oe or 140 ÷ 4 (= 35) or<br>0.4 × 140 (= 56) oe | | 4 | M1 |
| | "49" × 6 (= 294) oe or<br>"35" × 8 (= 280) oe or<br>(140 – "49" – "35") × 10 (= 560) or<br>"56" × 10 (= 560) | | | M1 for 1 correct |
| | "49" × 6 (= 294) oe **and**<br>"35" × 8 (= 280) oe **and**<br>(140 – "49" – "35") × 10 (= 560) or<br>"56" × 10 (= 560) | | | M1 for all correct |
| | *Correct answer scores full marks (unless from obvious incorrect working)* | 1134 | | A1 cao |
| | | | | **Total 4 marks** |

| | | | | |
|---|---|---|---|---|
| **24** | 475 × 0.16 (= 76) oe **or**<br>475 × (1 – 0.16) (= 399) oe | | 4 | M1 (working for shop A) |
| | 1 – 0.15 (= 0.85) **or** $x$ – 0.15$x$ = 408 **or**<br>100(%) – 15(%) (= 85(%)) **or**<br>$\frac{408}{85}$ (= 4.8) oe | | | M1 (working for shop B) |
| | 408 ÷ "0.85" (= 480) **or**<br>408 ÷ "85" × 100 (= 480) **or**<br>408 × 100 ÷ "85" (= 480) oe **or**<br>"4.8" × 100 (= 480) **or**<br>$\frac{408}{85} \times 15 (= 72)$ | | | M1 (working for shop B) |
| | *Working required* | **A**<br>**and**<br>72 and 76 seen | | A1 dep on M2 for **A** with correct working (72 and 76 seen) |
| | | | | **Total 4 marks** |

| | | | | | |
|---|---|---|---|---|---|
| **7** | $\frac{1}{4} \times 26.8\,(= 6.7)$ oe **or** $\frac{3}{4} \times 26.8\,(= 20.1)$ oe<br>**or** $2 \times 26.8\,(= 53.6)$ | | 4 | M1 | for method to find the discount off one calculator<br>**or** the reduced price of one calculator<br>**or** the cost of two calculators |
| | "6.7" × 3 × 2 (= 40.2) oe eg (26.8 – "6.7") × 2 (= 40.2)<br>**or** "20.1" × 2 (= 40.2) **or** $"53.6" - \frac{1}{4} \times "53.6"\,(= 40.2)$ oe<br>**or** $\frac{3}{4} \times "53.6"\,(= 40.2)$ oe | | | M1 | for method to find the reduced price of two calculators |
| | 50 – "40.2" | | | M1 | for a complete method |
| | *Correct answer scores full marks (unless from obvious incorrect working)* | 9.8(0) | | A1 | SCB2 for an answer of 29.9(0) **or** 36.6(0)<br>SCB1 for an answer of 23.2(0) **or** ±3.1(0) |
| | | | | | **Total 4 marks** |

<table>
<tr><th>Question</th><th>Working</th><th>Answer</th><th>Mark</th><th>Notes</th></tr>
<tr><td>6 a</td><td></td><td><table>
<tr><th></th><th>UK</th><th>Africa</th><th>USA</th><th>Total</th></tr>
<tr><td>Male</td><td>14</td><td>7</td><td>2</td><td>23</td></tr>
<tr><td>Female</td><td>16</td><td>9</td><td>2</td><td>27</td></tr>
<tr><td>Total</td><td>30</td><td>16</td><td>4</td><td>50</td></tr>
</table></td><td>3</td><td>B3 If not B3 then<br>B2 for at least 4 correct entries<br>If not B2 then<br>B1 for at least 2 correct entries</td></tr>
<tr><td>b</td><td>$\frac{9}{50}$ or 0.18</td><td>18</td><td>2</td><td>M1 for selecting 9 (may be seen in a calculation)<br>A1</td></tr>
<tr><td>7</td><td>3.80 ÷ 4 (=0.95) or<br>0.75 × 3.80 oe (=2.85)<br><br>7.33 – 3 × “0.95” (=4.48) or<br>7.33 – “2.85” (=4.48)<br><br>“4.48” ÷ 2</td><td>2.24</td><td><br><br>4</td><td>M1<br><br>M1<br><br>M1<br><br>A1 SC: Award B2 for an answer of £2.08 or £2.09</td></tr>
</table>

| Question | | Working | Answer | Mark | Notes |
|---|---|---|---|---|---|
| 3 | (a) | | 11 | 1 | B1 |
| | (b) | | 18 | 1 | B1 |
| | (c) | | Correctly completed pictogram | 1 | B1 1½ symbols oe |
| | | | | | **Total 3 marks** |

| | | | | | |
|---|---|---|---|---|---|
| 4 | (a) | | 40 | 1 | B1 |
| | (b) | $\frac{42}{80}\times 100$ oe, e.g. 42 × 1.25 | 52.5 | 2 | M1<br>A1 |
| | (c) | 0.72 × 350 oe | 252 | 2 | M1<br>A1 |
| | | | | | **Total 5 marks** |

| | | | | | |
|---|---|---|---|---|---|
| **3** | (a) | | Diameter | 1 | B1 |
| | (b) | | Chord | 1 | B1 |
| | (c) | | Sector shaded | 1 | B1 accept the semicircle shaded |
| | | | | | **Total 3 marks** |

| | | | | | |
|---|---|---|---|---|---|
| **4** | (a) | | A | 1 | B1 |
| | (b) (i) | | D | 1 | B1 |
| | (ii) | | 3 | 1 | B1 |
| | (c) | | Octagon | 1 | B1 accept regular octagon |
| | | | | | **Total 4 marks** |

| | | | | | |
|---|---|---|---|---|---|
| **5** | (a) | | $\frac{16}{20}$ | 1 | B1 |
| | (b) | | 12 squares shaded | 1 | B1 |
| | (c) | | 80 | 1 | B1 |
| | (d) | 48 ÷ 4 × 5 **or** 48 × 5 ÷ 4 **or** 48 ÷ 0.8 **or** 48 × 1.25 oe | | | M1 for a complete method |
| | | | 60 | 2 | A1 |
| | | | | | **Total 5 marks** |

| | | | | |
|---|---|---|---|---|
| **12** | e.g. $36 \times 50$ (= 1800) | | | M1 for calculating outgoings<br>could work in £ or p throughout |
| | e.g. $36 \times \frac{1}{2} \times 60$ (= 1080) **or** $36 \times \frac{1}{3} \times 40$ (= 480)<br>**or** $36 \times \left(1 - \frac{1}{2} - \frac{1}{3}\right) \times 25$ (= 150) | | | M1 for working out one source of income |
| | e.g. $36 \times \frac{1}{2} \times 60 + 36 \times \frac{1}{3} \times 40 + 36 \times \left(1 - \frac{1}{2} - \frac{1}{3}\right) \times 25$ (= 1710) | | | M1 for complete method to find the total income |
| | e.g. $\frac{"1800" - "1710"}{"1800"} \times 100$ **or** $\frac{[\text{outgoings}] - [\text{income}]}{[\text{outgoings}]} \times 100$ | | | M1 (dep on first 2 method marks) complete method to find percentage loss |
| | | 5 | 5 | A1 accept −5 |
| | | | | **Total 5 marks** |

| | | | | | |
|---|---|---|---|---|---|
| **13** a | | Rotation | | B1 | |
| | | (0, 0) | | B1 | or *O* or origin |
| | | 90° clockwise | 3 | B1 | NB award no marks if more than one transformation is described |
| b | | Shape **R** in correct position | 2 | B2 | Vertices at (−4, 1) (−4, 4) (−5, 4) (−5, 2) (−6, 2) (−6, 1) |
| | | | | B1 | for a correct reflection in the line $x = k$ where $k \neq -1$ **OR** at least 4 vertices in the correct position |
| | | | | | **Total 5 marks** |

| | | | | | | |
|---|---|---|---|---|---|---|
| **12** | (a) | | $4x - x^2$ | 1 | B1 | |
| | (b) | e.g. $1.5 \times 2.4 - (-5.6)$ **or** $1.5 \times 2.4 + 5.6$ **or** $3.6 + 5.6$ oe | | 2 | M1 | for a correct substitution |
| | | | 9.2 | | A1 | accept $\frac{46}{5}$ or $9\frac{1}{5}$ |
| | (c) | $y + e = dx$ oe **or** $\frac{y}{x} = d - \frac{e}{x}$ | | 2 | M1 | for a correct first step |
| | | | $d = \frac{y + e}{x}$ | | A1 | oe e.g. $d = \frac{y}{x} + \frac{e}{x}$ |
| | | | | | | **Total 5 marks** |

| | | | | | | |
|---|---|---|---|---|---|---|
| **13** | (a) | e.g. $\frac{180}{750} \times 100$ oe **or** $0.24 \times 100$ | | 2 | M1 | for a complete method |
| | | | 24 | | A1 | |
| | (b) | e.g. $32.50 \times 180$ (= 5850)<br>**or**<br>e.g. $0.94 \times 32.50$ oe (= 30.55) | | 3 | M1 | for finding the total income<br>**or** 94% of the cost of one ticket |
| | | e.g. $0.94 \times$ "5850" oe<br>**or**<br>"5850" – $0.06 \times$ "5850" oe<br>**or**<br>$180 \times$ "30.55" | | | M1 | for a complete method |
| | | | 5499 | | A1 | |
| | | | | | | **Total 5 marks** |

| Question | | Working | Answer | Mark | Notes |
|---|---|---|---|---|---|
| **14** | (a) | $0.39 \times 450$ **or** $\frac{39}{100} \times 450$ **or** $\frac{450}{100} \times 39$ oe eg $3 \times 45 + 9 \times 4.5$ oe | | 2 | M1 |
| | | *Working not required, so correct answer scores full marks (unless from obvious incorrect working)* | 175.5 | | A1 |
| | (b) | | Brackets around $(8 - 5)$ | 1 | B1 $9 \times (8 - 5) - 2 = 25$ with no incorrect brackets, condone eg $(9 \times (8 - 5)) - 2 = 25$ which has extra brackets that are not incorrect |
| | (c) | | 1.1049(21029) | 2 | B2 for 1.1049(21029) ie 5 sf or better truncated or rounded<br>(B1 for 2.98... **or** 2.7 ) |
| | | | | | **Total 5 marks** |

| | | | | | |
|---|---|---|---|---|---|
| **9** | (a) | | 26 | 1 | B1 |
| | (b) | eg $\frac{30-12}{30}\left(=\frac{18}{30}\text{oe}\right)$ | | 2 | M1 for $\frac{18}{30}$ or other correct but unsimplified fraction **or** an answer of $\frac{2}{5}$ |
| | | | $\frac{3}{5}$ | | A1 |
| | (c) | eg $\frac{8}{18}+\frac{3}{18}$ or $\frac{24}{54}+\frac{9}{54}$ oe | | 2 | M1 for two fractions with a correct common denominator with at least one numerator correct |
| | | eg $\frac{8}{18}+\frac{3}{18}=\frac{11}{18}$ or $\frac{24}{54}+\frac{9}{54}=\frac{33}{54}=\frac{11}{18}$ oe | | | A1 dep on M1, for a complete correct method leading to $\frac{11}{18}$ |
| | | | | | **Total 5 marks** |

| | | | | |
|---|---|---|---|---|
| **10** | eg $\pi\times\left(\frac{14}{2}\right)^2$ oe **or** $\pi\times7^2$ oe **or** $49\pi$ | | 2 | M1 |
| | | 154 | | A1 accept 153.86 – 154 |
| | | | | **Total 2 marks** |

| | | | | | |
|---|---|---|---|---|---|
| **19** | eg $\frac{2}{5}\times 150 (=60)$ **or** eg $0.32 \times 150$ (= 48) | | 5 | M1 | for finding the number of small mugs **or** number of medium mugs |
| | eg 150 – "60" – "48" (= 42) | | | M1 | for finding the number of large mugs |
| | eg "60" × 8.50 + "48"× 11.20 + "42" × 14.20(= 1644) **or** 510 + 537.6 + 596.4 (= 1644) | | | M1 | for working out the income, Profit = 504 implies M3 |
| | eg $\frac{"1644"-1140}{1140}\times 100$ **or** $\frac{"1644"}{1140}\times 100-100$ | | | M1 | (indep) for a complete method to find the percentage profit for **their total income** (must be greater than 1140) An answer of 144 implies M4 |
| | | 44 | | A1 | 44 or better (44.2105…) |
| | | | | | **Total 5 marks** |

| | | | | | | |
|---|---|---|---|---|---|---|
| **23** | (a) | (231 776 – 228 314) ÷ 228 314<br>**or** 3462 ÷ 228 314 (= 0.01516…)<br>**or** 231 776 ÷ 228 314 (= 1.01516…) | | 2 | M1 | |
| | | | 1.5 | | A1 | for 1.5 or better (1.516…)<br><br>(be careful: 3462 ÷ 231 776 × 100 = 1.49….) |
| | (b) | 231 776 ÷ 1.077 oe | | 3 | M2 | If not M2<br>then M1 for 1.077 or 107.7 or<br>1 + 0.077(=1.077 ) seen<br>but not 1 + 7.7% |
| | | | 215 000 | | A1 | for 215 000 or better<br>( 215 205.19…)<br><br>(if no marks awarded<br>SCB1 for 212000 or better (211990.71…)) |
| | | | | | | **Total 5 marks** |

| | | | | | |
|---|---|---|---|---|---|
| **24** | $0\times13+1\times17+2\times8+3x+4\times11$ or<br>(0 +) 17 + 16 + 3$x$ + 44 (= 77 + 3$x$) | | 4 | M1 | at least **3** correct products with intention to add.<br>eg award for 77 seen as this is sum of 3 products |
| | $(13+17+8+x+11)$ oe eg 49 + $x$<br>**or** $98+2x$ | | | M1 | Sum for total frequency or (frequency × 2) |
| | $\frac{"77+3x"}{"49+x"}=2$ oe e.g. $"77+3x"=2("49+x")$ | | | M1 | for use of mean in valid equation (ft their values for sum of products and their total frequency if M2 awarded previously) |
| | | 21 | | A1 | |
| | | | | | **Total 4 marks** |

| | | | | | |
|---|---|---|---|---|---|
| **14** (a) | $\frac{10.1}{39.8}\times100$ oe or $\frac{10\,100\,000}{39\,800\,000}\times100$ | | 2 | M1 | |
| | | 25.4 | | A1 awrt | |
| (b) | $\frac{21}{100}\times59.9$ (= 12.579) oe or<br>$\frac{21}{100}\times59\,900\,000$ (= 12 579 000) oe | | 3 | M1 | M2 $\frac{121}{100}\times59.9$ oe or<br>$\frac{121}{100}\times59\,900\,000$ oe |
| | 59.9 + "12.579" (= 72.479) or<br>59 900 000 + 12 579 000 (= 72 479 000) | | | M1 | |
| | | 72 | | A1 Accept 72 – 73 or<br>72 000 000 – 73 000 000 | |
| | | | | | **Total 5 marks** |

| | | | | |
|---|---|---|---|---|
| **15** | 48 ÷ 4 (=12) | | 4 | M1 could be on diagram |
| | 30 – "48 ÷ 4" (= 18) or 9 | | | M1 allow 9 on correct side of the triangle on the diagram |
| | 3 × "18" + "12" or 6 × "18 ÷ 2" + "12" or<br>"54" + "12" | | | M1 for a complete correct method |
| | | 66 | | A1 |
| | | | | **Total 4 marks** |

| | | | | | | |
|---|---|---|---|---|---|---|
| **14** | (a) | $\frac{86}{490}(\times 100)$ oe or<br>0.175(510…) (× 100) | | 2 | M1 | |
| | | *Working not required, so correct answer scores full marks (unless from obvious incorrect working)* | 17.6 | | A1 awrt 17.6 | |
| | (b) | $\frac{12}{100}\times 375$ (= 45) oe or 0.12 × 375 (= 45) oe<br>or<br>$\frac{10}{100}\times 375 + \frac{1}{100}\times 375 + \frac{1}{100}\times 375$ oe (= 45) or<br>37.5 + 3.75 + 3.75 (= 45) oe | | 3 | M1<br>Must see a calculation. Do not accept,for eg, 12% of 375 unless 45 seen | M2 $\frac{88}{100}\times 375$ oe |
| | | 375 – "45" or<br>375 – "37.5" – "3.75" – "3.75" oe or<br>375 – "37.5" – "7.5" oe | | | M1 | |
| | | *Working not required, so correct answer scores full marks (unless from obvious incorrect working)* | 330 | | A1 | |
| | | | | | | **Total 5 marks** |

| | | | | | |
|---|---|---|---|---|---|
| **15** | 40 – (17 + 15) (= 8) or<br>$\sqrt{17^2-15^2}\left(=\sqrt{289-225}=\sqrt{64}=8\right)$ | | 4 | M1 may be seen on diagram | |
| | "8" × "8" (= 64) | | | M1 for area of square (can be seen on diagram) | M2 for use of formula for area of trapezium<br>$\frac{1}{2}\times(15+"8"+"8")\times"8"$ |
| | $\frac{15\times"8"}{2}$ (= 60) oe or | | | M1 for area of triangle (can be seen on diagram) | |
| | *Working not required, so correct answer scores full marks (unless from obvious incorrect working)* | 124 | | A1 | |
| | | | | | **Total 4 marks** |

| | | | | | |
|---|---|---|---|---|---|
| **18** | eg 200 ÷ (3 + 2) (= 40) | | 5 | M1 | for a method to find one 'share' of the ratio |
| | eg 3 × "40" (= 120) **and** 2 × "40"(= 80) | | | M1 | for a method to find the number of white loaves **and** the number of brown loaves |
| | eg "120" × 1.50 (= 180) oe **and** "80" × 1.75 (= 140) oe<br>**or** "120" × 0.4 (= 48) oe **and** "80" × 0.6 (= 48) oe<br>**or** 0.4 × 1.50 (= 0.6) oe **and** 0.6 × 1.75 (= 1.05) oe | | | M1 | for a method to find income from white loaves **and** brown loaves<br>**or** number of white loaves **and** brown loaves that are entirely profit<br>**or** profit from a single white loaf or a single brown loaf |
| | eg 0.4 × "180" (= 72) oe **and** 0.6 × "140"(= 84) oe<br>**or** "48" × 1.50 (= 72) oe **and** "48" × 1.75 (= 84) oe<br>**or** "0.6" × "120"(= 72) oe **and** "1.05" × "80"(= 84) oe | | | M1 | for a complete method to find the total profit for the white loaves **and** the total profit for the brown loaves |
| | *Correct answer scores full marks (unless from obvious incorrect working)* | 156 | | A1 | cao<br>award SCB4 for an answer of 164 or 174 |
| | | | | | **Total 5 marks** |

| | | | | | | |
|---|---|---|---|---|---|---|
| **20** | (a) | 357 ÷ 0.17 oe<br>or<br>$0.17N = 357$ or $\frac{17}{100} \times N = 357$ oe<br>or<br>$\frac{357 \times 100}{17}$ oe eg 357 × 5.8(82…) | | 2 | M1 | a correct calculation for $N$ or a correct equation in $N$<br>(**not** 17% × $N$ = 357) |
| | | *Correct answer scores full marks (unless from obvious incorrect working)* | 2100 | | A1 | cao |
| | (b) | 806 – 650 (= 156)<br>or<br>$\frac{806}{650}$ (=1.24) oe | | 3 | M1 | |
| | | $\frac{806 - 650}{650}$ (×100) (= 0.24(×100))<br>or<br>"1.24" ×100 (= 124)<br>or<br>(1.24 – 1) × 100 | | | M1 | a correct calculation for the percentage increase or seeing 124 or 0.24 as either the answer or in part of the working. |
| | | *Correct answer scores full marks (unless from obvious incorrect working)* | 24 | | A1 | cao<br><br>(SCB1 if no marks scored for an answer of 19.3 – 19.4) |
| | | | | | | **Total 5 marks** |

| Question | | Working | Answer | Mark | Notes |
|---|---|---|---|---|---|
| **14** | (a) | $1236.5 - 1126.5$ **or** $110$ **or** $\frac{1236.5}{1126.5}$ **or** $1.09(7647...)$ **or** $\frac{1236.5}{1126.5}\times 100$ **or** $109(.7647...)$ | | | M1 |
| | | $\frac{1236.5-1126.5}{1126.5}$ **or** $\frac{"110"}{1126.5}$ **or** $\left(\frac{1236.5}{1126.5}-1\right)$ **or** $(1.09(764...)-1)$ **or** $\frac{1236.5}{1126.5}\times 100-100$ **or** $0.0976(475...)$ | | | M1 for method that would result in 9.76… or 0.0976… |
| | | | 9.76 | 3 | A1 for 9.76 - 9.765 |
| | (b) | $1126.5\times 1.19$ oe | | | M2 if not M2 then award M1 for $\frac{19}{100}\times 1126.5$ oe **or** $214(.035)$ |
| | | | 1341 | 3 | A1 for 1340 – 1342 |

| | | | | | |
|---|---|---|---|---|---|
| **19** (a) | 4.25 × 0.08 (= 0.34) oe | | 3 | M1 | M2 for 4.25 × 1.08 oe |
| | 4.25 + "0.34" | | | M1 | |
| | | 4.59 | | A1 | SC: B1 for 4.25 × 0.92 (= 3.91) oe |
| (b) | 9.45 ÷ 108 (= 0.0875) oe | | 3 | M1 | M2 for 9.45 ÷ 1.08 |
| | 9.45 ÷ 108 × 100 oe | | | M1 | |
| | | 8.75 | | A1 | |
| | | | | | **Total 6 marks** |

| | | | | | |
|---|---|---|---|---|---|
| **20** | e.g. 5 × 4 + 15 × 10 + 25 × 15 + 35 × 25 + 45 × 6 (= 1690)<br><br>**or** 20 + 150 + 375 + 875 + 270 (= 1690) | | 4 | M2 | For correct products using midpoints (allowing one error) with intention to add.<br><br>If not M2 then award M1 for products using frequency and a consistent value within the range (allowing one error) with intention to add or correct products using midpoint without addition. |
| | "1690" ÷ 60 | | | M1 | dep on M1 |
| | | 28.2 | | A1 | accept 28.1 – 28.2 |
| | | | | | **Total 4 marks** |

| | | | | | | |
|---|---|---|---|---|---|---|
| **21** | (a) | 8265 – 7500 (= 765) **or** $\frac{8265}{7500}$ (=1.102) | | 3 | M1 | 8265 – 7500 could be embedded in another calculation. |
| | | $\frac{"765"}{7500}\times 100$ oe **or** "1.102" × 100 – 100 oe | | | M1 | |
| | | | 10.2 | | A1 | oe |
| | (b) | e.g. 31.5(0) ÷ (1 – 0.3) | | 3 | M2 | for a complete method<br>e.g. 31.5(0) ÷ (1 – 0.3) |
| | | | | | (M1) | for 31.5(0) ÷ (100 – 30) (= 0.45)<br>**or** e.g. (1 – 0.3)$x$ = 31.5(0) |
| | | | 45 | | A1 | |
| | | | | | | **Total 6 marks** |

| | | | | | |
|---|---|---|---|---|---|
| **16** | | 3, 7, 8, 8 and one of 4 or 5 or 6 | | B3 | For a list of 5 correct numbers<br><br>(B2 for a list of 5 numbers with 2 of: median of 7, mode of 8, range of 5<br><br>B1 for a list of 5 or 6 numbers with 1 of:<br>median of 7, mode of 8, range of 5) |
| | | | | | **Total 3 marks** |

| | | | | | | |
|---|---|---|---|---|---|---|
| **17** | (a) | $520 - 465$ (= 55) **or** $\frac{520}{465}$ (=1.118…) | 11.8 | 3 | M1 | |
| | | $\frac{"55"}{465} \times 100$ **or** $100 \times$ ("1.118" – 1) oe | | | M1 | |
| | | | | | A1 | 11.8 or better (11.827956...) |
| | (b) | $0.12 \times 550$ (= 66) | 484 | 3 | M1 oe | M2 for $0.88 \times 550$ |
| | | 550 – "66" | | | M1 | |
| | | | | | A1 | |
| | | | | | | **Total 6 marks** |

| Question | Working | Answer | Mark | Notes |
|---|---|---|---|---|
| **25** (a) | eg 100 + 24 (=124 [%]) **or** 1 + 0.24 (= 1.24) **or** $\frac{180000}{124}$ (=1451.6...) | | 3 | M1 |
| | eg 180 000 ÷ 1.24<br>180 000 ÷ 124 × 100 or 180 000 × 100 ÷ 124 oe | | | M1 for a complete method |
| | *Working not required, so correct answer scores full marks (unless from obvious incorrect working)*<br><br>*NB: this question is one where students could misread the number of zeros (eg one too many or one too few) in the question, up to M2 could be awarded if a correct method is seen with this misread* | 145 000 | | A1 accept 145 000 − 145 200<br>(if a correct answer is seen in working and then rounded incorrectly, award full marks)<br>(if no marks awarded, SCB1 for 223 200 or 223 000) |
| (b) | for 0.018 × 120 000 oe **or** 2160 **or**<br>1.018 × 120 000 oe **or** 122 160 | | 3 | M1 For finding 1.8% or 101.8% of the value<br>**OR** M2 for 120 000 × $1.018^3$ **or** 120 000 × $1.018^4$ **or** 128 876.09 |
| | 1.018 × "122 160" (= 124 358.88) oe **and**<br>1.018 × "124 358.88" (= 126 597.34) oe | | | M1 for completing the method<br>(M1 for 120 000 × $1.018^2$ **or** 124 358.88) |
| | *Working not required, so correct answer scores full marks (unless from obvious incorrect working)*<br><br>*NB: this question is one where students could misread the number of zeros in 120 000 (eg one too many or one too few) in the question, up to M2 could be awarded if a correct method is seen with this misread* | 127 000 | | A1 or 126 597 – 126 600<br>(if a correct answer is seen in working and then rounded incorrectly, award full marks)<br>**SC:** if no other marks gained award M1 for 1.054 × 120 000 oe **or** 126 480 **or** 6 480<br><br>accept (1 + 0.018) as equivalent to 1.018 throughout |
| | | | | **Total 6 marks** |

| | | | | |
|---|---|---|---|---|
| **9** | $12 \times 9 \times 6$ | | 2 | M1 |
| | | 648 | | A1 cao |
| | | | | **Total 2 marks** |

| | | | | | |
|---|---|---|---|---|---|
| **10** | (a) | | $\frac{5}{29}$ | 2 | B2 for a correct simplified fraction (B1 for $\frac{25}{145}$ oe or for $\frac{29}{5}$) |
| | (b) | $\frac{9}{25} \times 100$ or $\frac{9}{25} = \frac{36}{100}$ | | 2 | M1 |
| | | | 36 | | A1 |
| | (c) | $28 \div 16 \times 27$ oe eg $1.75 \times 27$ or $1.75 \times 11$ | | 2 | M1 Fully correct method |
| | | | 47.25 | | A1 cao |
| | | | | | **Total 6 marks** |

| | | | | |
|---|---|---|---|---|
| **11** | | Triangle drawn with correct intersecting arcs from *A* (5 cm) and *B* (8 cm) | 2 | B2 for arcs intersecting within overlay and triangle drawn<br>(B1 for correct 5 cm arc from *A* or 8 cm arc from *B*)<br>An accurate triangle drawn without arcs scores B1 |
| | | | | **Total 2 marks** |

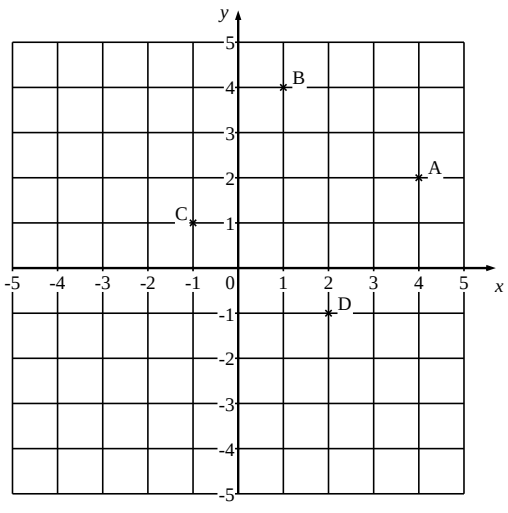
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|---|---|---|---|---|---|
| **21** (a) | 1 + 0.04 (= 1.04) **or**<br>100(%) + 4(%) (= 104(%)) **or**<br>$\frac{634\,400}{104}$ (= 6100) oe | | 3 | M1 | |
| | 634 400 ÷ "1.04" **or**<br>634 400 ÷ "104" × 100 **or**<br>634 400 × 100 ÷ "104" oe | | | M1 | |
| | | No and 610 000 | | A1 dep on M2 for no and 610 000 seen oe<br>E.g. Still (band) B and 610 000 oe | |
| (b) | "0.85" × "0.85" (= 0.7225) oe **or**<br>"0.85" – ("0.85" × 0.15) (= 0.7225) **or**<br>$\frac{"85"\times"85"}{100}$ (= 72.25) oe or<br>[0.85 and 85 must come from correct working] | | 3 | M1 allow use of their amount<br>e.g.<br>200 × "0.85" × "0.85" (= 144.5) | M2 for<br>15 + (0.15 × "85")<br>or<br>15 + 12.75 |
| | 1 – "0.7225" **or** 0.2775 **or** 100 – "72.25" | | | M1 e.g.<br>$\frac{200-"144.5"}{200}$<br>(×100) | |
| | | 27.75 | | A1 oe allow 27.8 or 28 | |
| | | | | **Total 6 marks** | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **19** (a) | 4 × 6 × 80 (= 1920) | 4 × 6 (= 24)<br>**or** 2160 ÷ 80 (= 27) | 2160 ÷ (80 × 4) (= 6.75) | | 4 | M1 | for method to work out total income<br>**or** income from one box **or** expenditure for one box<br>**or** income per cup |
| | 2160 – "1920" (= 240)<br>**or** $\frac{2160}{"1920"}(=1.125)$ | "27" – "24" (= 3)<br>**or** $\frac{"27"}{"24"}(=1.125)$ | "6.75" – 6 (= 0.75)<br>**or** $\frac{"6.75"}{6}(=1.125)$ | | | M1 | for working out the profit **or** income ÷ expenditure |
| | $\frac{"240"}{"1920"}(\times 100)$<br>**or** 0.125 (× 100)<br>**or** $\left(\frac{2160}{"1920"}-1\right)(\times 100)$<br>**or** ("1.125" – 1) (× 100)<br>**or** "1.125" × 100 (= 112.5) | $\frac{"3"}{"24"}(\times 100)$<br>**or** 0.125 (× 100)<br>**or** $\left(\frac{"27"}{"24"}-1\right)(\times 100)$<br>**or** ("1.125" – 1) (× 100)<br>**or** "1.125" × 100 (= 112.5) | $\frac{"0.75"}{6}(\times 100)$<br>**or** 0.125 (× 100)<br>**or** $\left(\frac{"6.75"}{6}-1\right)(\times 100)$<br>**or** ("1.125" – 1) (× 100)<br>**or** "1.125" × 100 (= 112.5) | | | M1 | for a method to reach one step from the answer ie getting to $\frac{1}{8}$ oe or 0.125 or 112.5 |
| | *Working required* | | | 12.5 | | A1 | dep on M1 |
| (b) | | | | 8.5 | 1 | B1 | cao |
| (c) | | | | 125 | 1 | B1 | allow $124.\dot{9}$ or 124.99… |
| | | | | | | | **Total 6 marks** |

| | | | | | |
|---|---|---|---|---|---|
| **26** | 72 × 1000 (= 72000) or 72 ÷ 60 (= 1.2) or 72 ÷ 60 ÷ 60 (= 0.02) or 60 ÷ 60 × 1000 (= 3.6) | 20 | 3 | M1 | for at least **one** of × 1000 or ÷ 60 |
| | $\frac{72}{60\times60}\times1000$ | | | M1 | (dep) for a complete method |
| | | | | A1 | |
| | | | | | **Total 3 marks** |

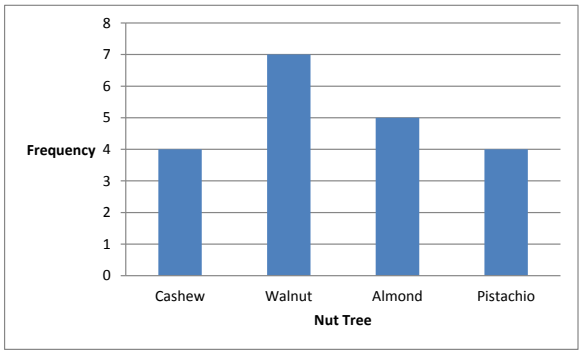
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|---|---|---|---|---|---|---|
| **27** | (a) | 6×25 + 6×45 (= 150 + 270 = 420) | 20 | 4 | M1 | for 6×25 (=150) or 6×45 (=270) |
| | | "150" + "270" – 350 (= 70) or "420" – 350 | | | M1 | |
| | | $\frac{"70"}{350}\times100$ | | | M1 | (dep on M2) |
| | | | | | A1 | |
| | | **Alternative scheme** | | | | |
| | | 6×25 + 6×45 (= 150 + 270 = 420) | 20 | 4 | M1 | for 6×25 (=150) or 6×45 (=270) |
| | | $\frac{"420"}{350}\times100 = 120$ | | | M1 | |
| | | "120" – 100 | | | M1 | (dep on M2) |
| | | | | | A1 | |
| | (b) | 500 000 ÷ 8 (=62 500) | 6 250 000 | 3 | M1 | |
| | | 500 000 ÷8×100 | | | M1 | for a complete method |
| | | | | | A1 | |
| | | | | | | **Total 7 marks** |

**5**

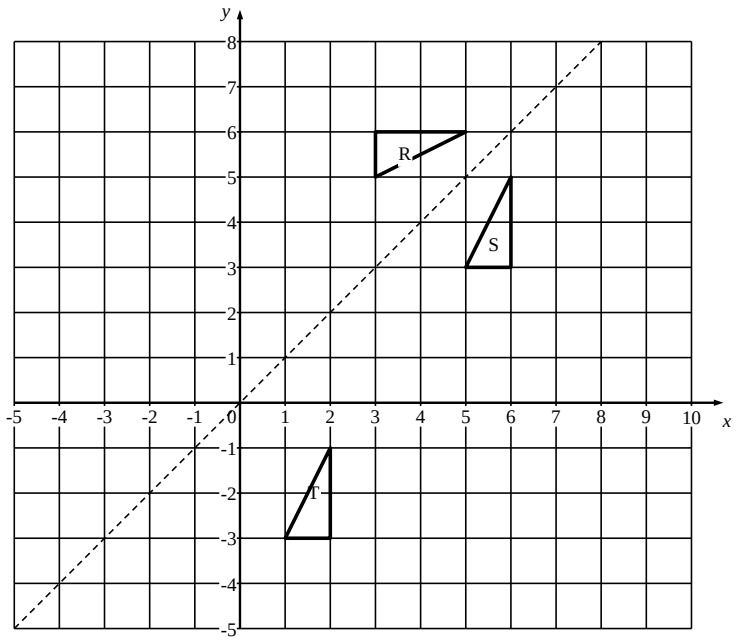


**7a**

| Nut tree | | Frequency |
|---|---|---|
| Cashew | | 4 |
| Walnut | | 7 |
| Almond | | 5 |
| Pistachio | | 4 |



17



| | | | | | |
|---|---|---|---|---|---|
| **24** (a) | 545 – 500 ( = 45) **or** 592 – 545 ( = 47) | | 4 | M1 | may be seen as part of a calculation |
| | $\frac{45}{500}\times100(=9)$ **or** $\frac{47}{545}\times100(=8.6)$ | | | M1 | for one correct expression (allow 8 or 8.7 from a correct expression for 8.6 throughout) |
| | $\frac{45}{500}\times100(=9)$ **and** $\frac{47}{545}\times100(=8.6)$ | | | M1 | for both correct expressions **or** having found "9%" finds 109% of 545: 1.09 × 545(=594.05) or 9% of 545 (49.05) or having found "8.6%" finds 108.6% of 500: 1.086 × 500(=543) or 8.6% of 500 (43) |
| | | No, 9(%) and 8.6(%) | | A1 | for no oe, 9% and 8.6% seen or no oe and 9% and 594.05 or 8.6% and 543 or No, 49.05 > 45 or No 594.05 > 592 oe |
| **Alternative mark scheme for 8(a)** | | | | | |
| | $\frac{545}{500}\times100(=109)$ or $\frac{545}{500}(=1.09)$ **or** $\frac{592}{545}\times100(=108.6)$ or $\frac{592}{545}(=1.086)$ | | 4 | M3 | for both correct expressions which should lead to 109 **or** 1.09 **and** 108.6 **or** 1.086 (allow 108 or 108.7 from correct working for 108.6 or 1.08 or 1.087 from correct working for 1.086 throughout)<br><br>(if not M3 then award M2 for one of these expressions) |
| | | No, 109(%) and 108.6(%) | | A1 | oe eg no and 1.09 and 1.086 |
| (b) | 952 ÷ 85 × 100 oe (=1120) | | 3 | M1 | for a method to find price before discount |
| | 0.15 × "1120" or "1120" – 952 oe | | | M1 | for a correct method to find discount |
| | | 168 | | A1 | |
| | | | | | ***Total 7 marks*** |

M2 for $\frac{952}{85}\times15$

| | | | | | | |
|---|---|---|---|---|---|---|
| **19** | (a) | 720 ÷ 12 (= 60) or 78 × 12 (= 936) | | | 4 | M1 |
| | | 78 – '60' (= 18)<br>or '936' – 720 (= 216) | $'x' \times 720 = 936$<br>or $720(1+\frac{P}{100}) = '936'$<br>or $('x'=)\ \frac{'936'}{720}\ (=1.3)$ oe | | | M1 |
| | | $\frac{'18'}{60}\times 100$ or $\frac{'216'}{720}\times 100$ | $'1.3'\times 100-100$ oe<br>or $(1.3-1)\times 100$ | | | M1 complete method to find *P* |
| | | | | 30 | | A1 ignore extra % sign if given by candidate. |
| | (b) | 0.18 × 1600 (= 288) oe<br>or 0.82 × 1600 + 800 (= 2112) | | | 3 | M1 if 1600 × 18% seen, must have further processing of the 18% or the value (288) given. M2 for 1.5 × 12.5 (= 18.75) or 18 ÷ 1.5 (= 12) |
| | | 0.125 × (1600 + 800) (= 300) oe<br>or (1600 + 800) × 0.875 (= 2100) | | | | M1 |
| | | | | Coupon B and correct figures seen | | A1 for Coupon B **and** 288 and 300 or 18.75(%) and 18(%) or 12(%) and 12.5(%) or 2112 and 2100 |
| | | | | | | **Total 7 marks** |

| | | | | | |
|---|---|---|---|---|---|
| **21** | (a) | $7 \times 5 \times 14$ (= 490) oe **or**<br>$7 \times 14$ (= 98) **and** $400 \div 5$ (= 80) | | 4 | M1 for working out the pay per week or pay per day |
| | | "490" – 400 (= 90) **or**<br>"98" – "80" (= 18) **or**<br>"98" ÷ "80" oe **or** "490" ÷ 400 oe **or** 1.225 oe | | | M1 |
| | | $\frac{"90"}{400}(\times 100)(=0.225)$ oe **or**<br>$\frac{"18"}{"80"}(\times 100)(=0.225)$ oe **or**<br>$\frac{"98"}{"80"} \times 100 (=122.5)$ oe **or**<br>$\frac{"490"}{400} \times 100 (=122.5)$ oe **or**<br>"1.225" – 1 (= 0.225) | | | M1 dep on M2 |
| | | *Correct answer scores full marks (unless from obvious incorrect working)* | 22.5 | | A1 oe allow 23% with M3 awarded |
| | (b) | E.g. $1 - 0.06$ (= 0.94) or<br>100(%) − 6(%) (= 94(%)) or<br>$\frac{23\,030}{94}$ (= 245) oe | | 3 | M1 |
| | | E.g. $23\,030 \div$ "0.94" or<br>$23\,030 \div$ "94" $\times 100$ or<br>$23\,030 \times 100 \div$ "94" or<br>"245" $\times 100$ | | | M1 |
| | | *Correct answer scores full marks (unless from obvious incorrect working)* | 24 500 | | A1 |
| | | | | | **Total 7 marks** |

| | | | | | |
|---|---|---|---|---|---|
| **16** | (a) | 4 × 120 (= 480) | | | M1 |
| | | e.g. 120 ÷ 2 × 5 (= 300) **or**<br>120 × 0.4 × 7 (= 336) **or**<br>(120 – '60' – '48') × 8 (= 96) **or**<br>120 × 0.1 × 8 (= 96) | | | M1 for a method to find the income for one of the selling prices |
| | | e.g. (120 ÷ 2 × 5) + (120 × 0.4 × 7) + ((120 – '60' – '48') × 8) (= 732) **or**<br>(120 ÷ 2 × 5) + (120 × 0.4 × 7) + (120 × 0.1 × 8) (= 732) **or**<br>'300' + '336' + '96' (= 732) | | | M1 for a complete method to find the total income |
| | | e.g. $\frac{'732'-'480'}{'480'}\times 100$ **or**<br>'252' ÷ '480' × 100 **or**<br>$\left(\frac{'732'}{'480'}\times 100\right)-100$ or 152.5 – 100<br>**or**<br>$\left(\frac{'732'}{'480'}-1\right)\times 100$ or 0.525 × 100 | | | M1 for a complete method to find the percentage profit |
| | | | 52.5 | 5 | A1 accept 53 |
| | (b) | e.g. 1 + 0.2 (= 1.2) **or**<br>100(%) + 20(%) (= 120(%)) **or**<br>$\frac{15}{120}$ (= 0.125) oe | | | M1 |
| | | e.g. 15 ÷ 1.2 **or**<br>15 ÷ 120 × 100 **or**<br>15 × 100 ÷ 120 | | | M1 dep |
| | | | 12.5(0) | 3 | A1 accept (£)12.5, (£)12.50p, 1250p if the £ sign is crossed out |
| | | | | | **Total 8 marks** |

| | | | | | |
|---|---|---|---|---|---|
| **16 ALT** | (a) | 4 × 120 (= 480) | | | M1 |
| | | e.g. 120 ÷ 2 × 1 (= 60) **or**<br>120 × 0.4 × 3 (= 144) **or**<br>(120 – '60' – '48') × 4 (= 48) **or**<br>120 × 0.1 × 4 (= 48) | | | M1 for a method to find the profit of one of the books |
| | | e.g. (120 ÷ 2 × 1) + (120 × 0.4 × 3) +<br>((120 – '60' – '48') × 4) (= 252) **or**<br>(120 ÷ 2 × 1) + (120 × 0.4 × 3) +<br>(120 × 0.1 × 4) (= 252) **or**<br>'60' + '144' + '48' (= 252) | | | M1 for a complete method to find the total profit |
| | | '252' ÷ '480' × 100 oe | | | M1 for a complete method to find the percentage profit |
| | | | 52.5 | 5 | A1 accept 53 |
| | (b) | e.g. 1 + 0.2 (= 1.2) **or**<br>100(%) + 20(%) (= 120(%)) **or**<br>$\frac{15}{120}$ (= 0.125) oe | | | M1 |
| | | e.g. 15 ÷ 1.2 **or**<br>15 ÷ 120 × 100 **or**<br>15 × 100 ÷ 120 | | | M1 dep |
| | | | 12.5(0) | 3 | A1 accept (£)12.5, (£)12.50p, 1250p if the £ sign is crossed out |
| | | | | | **Total 8 marks** |