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EDEXCEL INTERNATIONAL GCSE MATHS: QUESTIONS BY TOPIC

Ratio & Proportion (R1)

International GCSE Mathematics A (4MA1) · Foundation tier

52 questions · 201 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

52 questions · 201 marks · 2 sub-topics

SUB-TOPIC R1a

RATIO

Sub-topic R1a · 37 questions · 143 marks · lowest tariff first



19 Anna and Lionel share \$675 in the ratio 4 : 5

Lionel gives $\frac{3}{5}$ of his share of the money to his mother.

How much money does Lionel give to his mother?

\$.....

(Total for Question 19 is 3 marks)

20 $E = n^2 + n + 5$

(a) Work out the value of E when $n = 3$

$E =$
(1)

Ali thinks that the value of E will be a prime number for any whole number value of n .

(b) Is Ali correct?

You must give a reason for your answer.

.....
.....
(2)

(Total for Question 20 is 3 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)



10 All the teachers at a school are either left footed or right footed.

At the school

the number of left footed teachers : the number of right footed teachers = 3 : 13

A teacher at the school is picked at random.

(a) Find the probability that this teacher is left footed.

(1)

At the school, there are 18 left footed teachers.

(b) How many right footed teachers are there?

(2)

(Total for Question 10 is 3 marks)



- 23** Change 22 metres per second to a speed in kilometres per hour.
Show your working clearly.

.....km/h

(Total for Question 23 is 3 marks)

- 24** 3 years ago, the ratio of Tom's age to Clemmie's age was 2 : 7
Tom is now 15 years old and Clemmie is now x years old.
Find the value of x .

$x =$

(Total for Question 24 is 3 marks)



- 21** There are some ice lollies in a freezer.

The flavour of each ice lolly is banana or strawberry or mint or chocolate.

Julius takes at random an ice lolly from the freezer.

The table shows the probabilities that the flavour of the ice lolly that Julius takes is banana or strawberry or chocolate.

Flavour	banana	strawberry	mint	chocolate
Probability	0.35	0.32		0.12

Work out the probability that the flavour of the ice lolly that Julius takes is either strawberry or mint.

(Total for Question 21 is 3 marks)

- 22** A football team played 55 games.
Each game was won, drawn or lost.

number of games won : number of games drawn : number of games lost = 6 : 3 : 2

Work out how many more games the team won than the team lost.

(Total for Question 22 is 3 marks)



- 9 Kamal sells 240 ice creams for a total of \$640

$\frac{1}{3}$ of the ice creams he sells are large.

The cost of each large ice cream he sells is \$3.80

All the other ice creams he sells are small.

He sells each small ice cream for the same cost.

Work out the cost of each small ice cream.

\$.....

(Total for Question 9 is 4 marks)

- 10 (a) Write the ratio 32 : 80 in its simplest form.

.....
(2)

There are only red counters and blue counters in a bag.

In the bag

the number of red counters : the number of blue counters = 5 : 7

- (b) What fraction of the counters in the bag are red?

.....
(1)

(Total for Question 10 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 On a farm there are chickens, ducks and pigs.

The ratio of the number of chickens to the number of ducks is $7:2$

The ratio of the number of ducks to the number of pigs is $5:9$

There are 36 pigs on the farm.

Work out the number of chickens on the farm.

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



17 Danil, Gabriel and Hadley share some money in the ratios $3:5:9$

The difference between the amount of money that Gabriel receives and the amount of money that Hadley receives is 196 euros.

Work out the amount of money that Danil receives.

..... euros

(Total for Question 17 is 3 marks)

18 The diagram shows triangle ABC

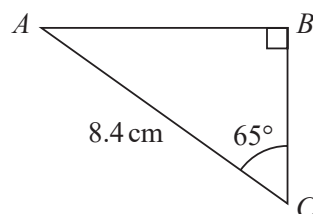


Diagram **NOT**
accurately drawn

Work out the length of the side AB

Give your answer correct to 3 significant figures.

..... cm

(Total for Question 18 is 3 marks)



- 7 (a) Write the ratio $42 : 96$ in its simplest form.

.....
(2)

There are only apples and pears in a fruit basket so that

the number of apples : the number of pears = $4 : 11$

- (b) What fraction of the fruit in the basket is pears?

.....
(1)

(Total for Question 7 is 3 marks)

- 8 Danielle is going to print some business cards.

She uses this rule to work out the total cost, in euros, of printing the business cards.

Total cost = price per card $\times$ number of cards + fixed fee

price per card = 0.14 euros

fixed fee = 25 euros

Danielle is going to print 350 business cards.

Work out the total cost of printing the business cards.

..... euros

(Total for Question 8 is 3 marks)



15 Bella and Millie share some money in the ratio 5 : 2

Bella receives 10.50 euros more than Millie.

Work out the total amount of money they share.

..... euros

(Total for Question 15 is 3 marks)

16 Work out the value of

$$\frac{15.2 \times 4.1}{8 - \sqrt{3.7}}$$

Write down all the figures on your calculator display.

.....

(Total for Question 16 is 2 marks)



10 Orange squash is made from orange juice and water.

Sean has two different cartons of orange squash, carton **P** and carton **Q**.
The table gives information about the two cartons.

Carton P	Carton Q
Total volume of orange squash is 250 millilitres	Total volume of orange squash is 250 millilitres
30% of the total volume is orange juice and the remainder is water	160 millilitres of the total volume is water and the remainder is orange juice

Work out the difference in the volume of orange juice in carton **P** and the volume of orange juice in carton **Q**.

..... millilitres

(Total for Question 10 is 3 marks)



20 In a box, there are only green sweets, orange sweets and yellow sweets.

There are 280 sweets in the box so that

the number of green sweets : the number of orange sweets = 2 : 3

and

the number of orange sweets : the number of yellow sweets = 1 : 5

Work out how many green sweets there are in the box.

(Total for Question 20 is 3 marks)



20 C grams of chocolate is shared in the ratios $2:5:8$

The difference between the largest share and the smallest share is 390 grams.

Work out the value of C

$C = \dots\dots\dots$

(Total for Question 20 is 3 marks)

21 Solve the simultaneous equations

$$\begin{aligned}x + 2y &= 15 \\ 4x - 6y &= 4\end{aligned}$$

Show clear algebraic working.

$x = \dots\dots\dots$

$y = \dots\dots\dots$

(Total for Question 21 is 3 marks)



11 (a) Work out the value of $(4 + 3 + 6)^2$

.....
(1)

$$64 = 4^n$$

(b) Write down the value of n

$n =$
(1)

(c) Work out the value of $\frac{\sqrt{9.3 + 2.8^3}}{3.2 \times 1.2}$

Write down all the figures on your calculator display.

.....
(2)

(Total for Question 11 is 4 marks)

12 Last season, Alisha and Jaya scored goals for their team in the ratio 4 : 7
Jaya scored 39 more goals than Alisha.

Work out the number of goals Alisha scored.

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



16 Last season, the number of goals scored by Arjun, by Simon and by Kath for their football team were in the ratios $2:5:8$

Simon scored 12 more goals than Arjun.

Work out the number of goals scored by Kath.

(Total for Question 16 is 3 marks)



21 Avril bakes a cake.

She uses flour, butter and sugar such that

$$\begin{aligned}\text{weight of flour : weight of butter} &= 6 : 5 \\ \text{weight of butter : weight of sugar} &= 3 : 2\end{aligned}$$

Avril uses 120 grams of sugar.

Work out the weight of flour Avril uses.

..... grams

(Total for Question 21 is 3 marks)



17 In a box,

number of red buttons : number of blue buttons = 5 : 3

number of blue buttons : number of green buttons = 1 : 2

There are 48 green buttons in the box.

Work out the number of red buttons in the box.

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



19 Andreas, Isla and Paulo share some money in the ratios 3 : 2 : 5

The **total** amount of money that Isla and Paulo receive is £76 more than the amount of money that Andreas receives.

Andreas buys a video game for £48.50 with some of his share of the money.

Work out how much money Andreas has left from his share of the money when he has bought the video game.

£.....

(Total for Question 19 is 4 marks)



20 Mariana sells bags of bird food.

The bags that Mariana sold last week each contained 12 kg of seeds.

The bags that she is going to sell next week will each contain a mixture of nuts and seeds where for each bag

$$\text{weight of nuts : weight of seeds} = 4 : 5$$

The total weight of the nuts and the seeds in each bag will be 19.35 kg

The weight of seeds in each bag that Mariana sells next week will be less than the weight of seeds in each bag that Mariana sold last week.

Work out this decrease as a percentage of the weight of seeds in each bag that Mariana sold last week.

Give your answer correct to one decimal place.

..... %

(Total for Question 20 is 4 marks)



15 Kim spends $\$N$

Of this, she spends

40% on food

$\frac{1}{4}$ on clothes

and the rest on petrol

Kim spends $\$P$ on petrol.

Work out the ratio $P:N$ in the form $a:b$ where a and b are integers.
Give your answer in its simplest form.

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



16 Roland, Seiso and Tim share the total cost of buying a plot of land.

Roland and Seiso share some of the cost in the ratio 2 : 5

Roland's share of the cost is \$1700

Tim's share of the cost is \$2150 **more** than Roland's share.

Work out the total cost of buying the plot of land.

\$.....

(Total for Question 16 is 4 marks)



21 Nancy has some coins with a total value of 85 pence.

She has only 2 pence coins and 5 pence coins.

The ratio

$$\text{number of 2 pence coins} : \text{number of 5 pence coins} = 1 : 3$$

Nancy has more 5 pence coins than 2 pence coins.

How many more?

(Total for Question 21 is 4 marks)

22 (a) Write 76000000 in standard form.

(1)

(b) Write 5.4×10^{-4} as an ordinary number.

(1)

(Total for Question 22 is 2 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)



14 Bilpa, Claudia and David share 1200 euros.

Bilpa gets $\frac{1}{5}$ of the 1200 euros.

Claudia gets 42% of the 1200 euros.

David gets the rest of the 1200 euros.

Given that

the amount of money Bilpa gets : the amount of money David gets = $1 : n$

work out the value of n

$n = \dots\dots\dots$

(Total for Question 14 is 4 marks)



12 In an orchard, there are 240 fruit trees.

There are only apple trees and pear trees such that

$$\text{number of apple trees} : \text{number of pear trees} = 5 : 3$$

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)



15 Adam sells chocolate cakes and lemon cakes.

The ratio

number of chocolate cakes he sells : number of lemon cakes he sells = 5 : 7

He sells 40 chocolate cakes.

Adam sells each chocolate cake for \$8.50

He sells each lemon cake for \$12.75

Work out the total amount of money Adam gets for selling the cakes.

\$.....

(Total for Question 15 is 4 marks)



23 Pau, Sam and Tia share £240 in the ratios 3 : 4 : 5

Sam and Tia each give £10 of their share to Pau.

Work out the ratios of the amounts of money that Pau, Sam and Tia now have.
Give your answer in its simplest form.

..... : :

(Total for Question 23 is 4 marks)



13 There are some people in a cinema.

$\frac{3}{5}$ of the people in the cinema are children.

For the children in the cinema,

number of girls : number of boys = 2 : 7

There are 170 girls in the cinema.

Work out the number of adults in the cinema.

(Total for Question 13 is 5 marks)



26 Alex makes 80 cakes to sell.

He makes chocolate cakes, lemon cakes and fruit cakes where

$$\begin{array}{ccccc} \text{number of} & : & \text{number of} & : & \text{number of} \\ \text{chocolate cakes} & & \text{lemon cakes} & & \text{fruit cakes} \end{array} = 3 : 2 : 5$$

Alex sells

all of the chocolate cakes

$\frac{3}{4}$ of the lemon cakes

$\frac{7}{8}$ of the fruit cakes

The profit he makes on each cake he sells is shown in the table.

Type of cake	Profit per cake he sells
chocolate	£2.00
lemon	£1.70
fruit	£2.40

Work out the total profit that Alex makes from the cakes he sells.

£.....

(Total for Question 26 is 5 marks)



12 Rose and Haydn share £250 in the ratio 2 : 3

Rose gives all her share of the money to charity.

Haydn gives 42% of his share of the money to charity.

Rose gives more money to charity than Haydn gives to charity.

Work out how much more.

£.....

(Total for Question 12 is 5 marks)



24 Behnaz makes 300 celebration cards so that

number of birthday cards : number of anniversary cards : number of congratulations cards = 7:5:3

$\frac{2}{5}$ of the birthday cards have numbers on them.

36% of the anniversary cards have numbers on them.

None of the congratulations cards have numbers on them.

Work out what fraction of the 300 cards have numbers on them.

Give your answer in its simplest form.

(Total for Question 24 is 5 marks)



11 A rental company has 360 cars and some vans.

The ratio of the number of cars to the number of vans is 3 : 5

$\frac{4}{9}$ of the cars are electric.

36% of the vans are electric.

The company has more electric vans than electric cars.

Work out how many more.
Show your working clearly.

(Total for Question 11 is 5 marks)



24 Ishir plants 600 bulbs in a garden.

He plants tulip bulbs, crocus bulbs and daffodil bulbs so that

number of tulip bulbs : number of crocus bulbs : number of daffodil bulbs = 9 : 4 : 2

45% of the tulip bulbs are for yellow flowers.

$\frac{5}{8}$ of the crocus bulbs are for yellow flowers.

All of the daffodil bulbs are for yellow flowers.

Work out the number of bulbs that are for yellow flowers.

(Total for Question 24 is 5 marks)



11 Calvin and Jenny are planning a holiday together.

The total cost of the flights is £1190

Calvin and Jenny share the cost of the flights so that

the money that Calvin pays : the money that Jenny pays = 2 : 5

(a) How much more money does Jenny pay than Calvin?

£
(3)

The cost of the villa for their holiday is £3500

They have to pay a deposit of 12% of this cost.

The rest of the cost of the villa is to be paid in monthly instalments of £220

(b) How many monthly instalments must be paid?

.....
(3)

(Total for Question 11 is 6 marks)



18 120 children go on an activity holiday.

The ratio of the number of girls to the number of boys is 3 : 5

On Sunday, all the children either go sailing or go climbing.

$\frac{16}{25}$ of the boys go climbing.

Twice as many girls go sailing as go climbing.

Work out how many children go sailing on Sunday.

.....
(Total for Question 18 is 6 marks)



7 In a field, there are 60 sheep and 24 cows.

- (a) Find the ratio of the number of sheep to the number of cows.
Give your ratio in its simplest form.

.....
(2)

In a barn, there are only white ducks and brown ducks.

In the barn, the ratio

number of white ducks : number of brown ducks = 3 : 7

- (b) What fraction of the ducks in the barn are white?

.....
(1)

Giles and Sarah share some bales of hay in the ratio 11 : 4

Sarah receives 20 bales of hay.

- (c) Work out how many bales of hay are shared in total.

.....
(3)

(Total for Question 7 is 6 marks)



SUB-TOPIC R1c

BEST BUYS, RECIPES & SCALING

Sub-topic R1c · 15 questions · 58 marks · lowest tariff first



8 There are 80 cars in a car park.

27 of the cars are red

10 of the cars are blue

the rest of the cars are white

One of the cars in the car park is chosen at random.

(a) Write down the probability that this car is red.

.....
(1)

(b) Find the probability that this car is white.

.....
(2)

(Total for Question 8 is 3 marks)

9 15 identical pencil cases cost 41.25 Swiss francs.

Work out the cost of 52 of these pencil cases.

..... Swiss francs

(Total for Question 9 is 2 marks)



11 A shop sells boxes of almonds.

12 of these boxes cost a total of 708 dirhams.

Work out the cost of 5 of these boxes.

..... dirhams

(Total for Question 11 is 2 marks)



- 14 Work out the value of $\frac{5.2^2 + 8.7}{\sqrt{14.5}}$

Write down all the figures on your calculator display.

.....
(Total for Question 14 is 2 marks)

- 15 Yuan sells fudge in small bags and in large bags.

Small bag Weight 150 g Cost £1.80
--

Large bag Weight 400 g Cost £5

Work out which bag is the better value for money.
Show your working clearly.

(Total for Question 15 is 3 marks)



12 A shop accepts payment in pounds (£) or in Swiss francs.

In the shop, a shirt costs £35 or 42 Swiss francs.

The cost of a jacket is £54

Alex works out the cost of the jacket in Swiss francs.

She uses the same exchange rate that was used for the cost of the shirt.

What is the cost of the jacket in Swiss francs?

..... Swiss francs

(Total for Question 12 is 3 marks)

13 A circle has radius 6.4 cm

Work out the area of the circle.

Give your answer correct to 3 significant figures.

..... cm²

(Total for Question 13 is 2 marks)



8 Mark is going to book a room in a hotel for 7 nights.

A room in the hotel costs the same amount for each night.

Mark knows that the room costs 150 euros for 2 nights.

The hotel also charges an additional tax of 5 euros for each night.

Work out the total cost of the room and the tax for 7 nights.

..... euros

(Total for Question 8 is 3 marks)

9 Remy chooses one food item and one drink for his breakfast.

He can choose one food item from cereal (*C*) or fruit (*F*) or a pastry (*P*)

He can choose one drink from milk (*M*) or juice (*J*) or tea (*T*)

(a) Write down all the possible combinations that Remy can choose.

.....

.....

(2)

Ahmed and Bryn share some blueberries in the ratio 3 : 4

(b) What fraction of the blueberries does Bryn get?

.....

(1)

(Total for Question 9 is 3 marks)



- 14 Maria is going to make blackcurrant pies.
Here is a list of ingredients to make 6 blackcurrant pies.

Blackcurrant pies
Ingredients for 6 pies

150 g flour
420 g blackcurrants
170 g sugar
95 g butter

Maria has the following ingredients.

755 g of flour	1265 g of blackcurrants
685 g of sugar	950 g of butter

Work out the greatest number of blackcurrant pies that Maria can make using her ingredients.
Show your working clearly.

(Total for Question 14 is 4 marks)



10 Freda is playing a car racing game on her computer.

She sets up her computer so that her car completes each lap in the same number of seconds.
Her car completes 3 laps in 72 seconds.

To win the game, Freda has to complete 68 laps in less than half an hour.

Does Freda win the game?

Give a reason for your answer.

(Total for Question 10 is 4 marks)



10 Here is a list of ingredients needed to make 24 currant buns.

Ingredients for 24 currant buns

100 grams	butter
70 grams	sugar
140 grams	flour
40 grams	currants
30 millilitres	milk
2	eggs

Gina wants to make 60 currant buns.

(a) Work out the weight of butter Gina needs.

..... grams
(2)

Hans wants to make 30 currant buns.

(b) Find the percentage increase in the weight of butter needed to make 30 currant buns rather than 24 currant buns.

..... %
(2)

(Total for Question 10 is 4 marks)



11 Johan wants to make some small cakes.

He finds a recipe that says he needs 360 grams of flour to make 15 small cakes.

Johan has 0.85 kg of flour.

Johan works out how much flour he would need to make 38 small cakes, using the information given in the recipe.

Does Johan have enough flour, according to the recipe, to make 38 small cakes?
Show your working clearly.

(Total for Question 11 is 4 marks)



11 Sophia spends a total of £6.30 on cheese.

She buys 500 g of Cheddar cheese and 200 g of Stilton cheese.

The cost of the Cheddar cheese is £9.20 for 1 kg.

Work out the cost of 1 kg of the Stilton cheese.

£.....

(Total for Question 11 is 4 marks)



11 David is going to make some biscuits.

Here is a list of ingredients for making 24 biscuits.

Ingredients for 24 biscuits

120 g butter

60 g sugar

200 g flour

David has

five 250 g packs of butter

750 g of sugar

1.4 kg of flour

Work out the maximum number of biscuits that David can make.
Show your working clearly.

(Total for Question 11 is 4 marks)



17 Here is a list of ingredients to make spaghetti carbonara for 4 people.

Spaghetti carbonara
Ingredients for 4 people

100 g pancetta
50 g cheese
300 g spaghetti
40 g butter
2 eggs

Joe is going to make spaghetti carbonara for 12 people.

(a) Work out how much cheese he needs.

..... g
(2)

Ruhi makes spaghetti carbonara.
She uses 180 g of butter.

(b) Work out how many people Ruhi makes the spaghetti carbonara for.

.....
(2)

(Total for Question 17 is 4 marks)



15 Here is a list of the ingredients needed to make 12 chocolate brownies.

Chocolate brownies
Ingredients for 12 brownies
150 g flour
250 g chocolate spread
3 eggs

Thalia buys exactly enough of these ingredients to make 120 of these brownies.

1.5 kg of flour costs £1.30

500 g of chocolate spread costs £2.60

6 eggs cost £1.10

Thalia sells all 120 brownies at £0.40 each.

Work out the profit that she makes.

£.....

(Total for Question 15 is 5 marks)



17 Here is a list of ingredients needed to make apple crumble for 6 people.

Apple Crumble
Ingredients for 6 people
12 apples 150g butter 195g flour 90g oats 120g sugar

Nadiya wants to make apple crumble for 14 people.

(a) Work out the amount of butter she needs.

.....g
(2)

Alison makes apple crumble for a group of people.

She uses 630g of oats.

(b) Work out the number of people in the group.

.....
(2)



At a cake sale, Michael sells some lemon cakes and some chocolate cakes.

the number of lemon cakes he sells : the number of chocolate cakes he sells = 2 : 7

Michael sells a total of 162 cakes.

(c) Work out the number of lemon cakes Michael sells.

.....
(2)

(Total for Question 17 is 6 marks)



14 Here is a list of ingredients needed to make 6 biscuits.

Biscuits

Makes 6 biscuits

60 g sugar
75 g butter
1 egg
90 g flour
65 g chocolate

Asha makes some of these biscuits.
She uses 450 g of flour.

(a) How many biscuits does Asha make?

.....
(2)

Julie makes 84 of these biscuits.

(b) What weight of butter does Julie use?

..... g
(2)

Asha and Julie pay a total of 624 rupees for the ingredients.
The ratio of the amount Asha pays to the amount Julie pays is 3 : 5

(c) How much does Julie pay?

..... rupees
(2)

(Total for Question 14 is 6 marks)



MARK SCHEMES

official mark schemes, in the same order as the questions



19	$675 \div (5 + 4) \times 5 (= 375)$	225	3	M1	M2 $675 \div (5 + 4) \times 3$
	"375" $\div 5 \times 3$			M1 dep M1	
				A1	
				Total 3 marks	

20	For example,		No + reason	2	M1	for evaluating E correctly for any value of n
	n	E				
	1	7				
	2	11				
	3	17				
	4	25				
	5	35				
					A1	for No with E evaluated correctly as a non-prime number
					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	
	$(7-2) \times "230"$ or $7 \times "230" - 2 \times "230"$ 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 20000×1.08 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
9 (a)	Eg $6 \times 3 - 2 \times -5$ or 18 and $(-)10$	28	2	M1 for correct substitution
	(b) Eg $2 - 15 = 2p$ or $2p = -13$ oe or $p = \frac{B-3m}{2}$	$-\frac{13}{2}$ oe	2	A1 M1 for isolating $2p$ in a correct equation A1
10 (a)	$13 \times 18 \div 3$ or 13×6	$\frac{3}{16}$ oe	1	B1
		78	2	M1 A1



24	$15 - 3 : x - 3 = 2 : 7$ or $(15 - 3) \div 2 (= 6)$	$(n =) (15 - 3) \div \frac{2}{2+7} (= 54)$ where n is the total age 3 years ago		3	M1	M2 for $\frac{(15-3) \times 7}{2} (= 42)$
	$\frac{x-3}{15-3} = \frac{7}{2}$ oe or $7 \times "6" (= 42)$	"54" $\times \frac{7}{2+7} (= 42)$			M1	
			45		A1	
					Total 3 marks	

25	$105 \div (5 \times 4) (= 5.25)$ oe or $105 \div (4 \times 3) (= 8.75)$ oe or $105 \div (3 \times 5) (= 7)$		3	M1
	"8.75" – "5.25"			M1 dep on previous M1. If M1 gained and they have worked out 3 pressures, award M1 for their highest minus their lowest.
		3.5		A1 oe
				Total 3 marks



						Total 3 marks
--	--	--	--	--	--	----------------------

Question		Working	Answer	Mark		Notes
19	(a)		-5, 5, 5, -5	2	B2	All 4 correct values If not B2 then B1 for 2 or 3 correct values
	(b)		Fully correct curve	2	M1 A1	Plotting at least 6 points correctly from their table dep on B1 in part(a) Do not accept horizontal line at top of curve or straight line segments
						Total 4 marks

20	(a)	$40 \div 16 \times 12$	30	2	M1 A1	$40 \times \frac{12}{16}$ oe
	(b)	$525 \div 100^2$	0.0525 oe	2	M1 A1	
						Total 4 marks

21		P(mint =) $1 - (0.35 + 0.32 + 0.12)$ (= 0.21) P(strawberry or mint =) $0.32 + "0.21"$	0.53 oe	3	M1 M1 A1	Or a correct equation summing to 1 Dep Allow 0.53/1
						Total 3 marks

22		$55 \div (6 + 3 + 2)$ (= 5) $(6 \times "5") - (2 \times "5")$	20	3	M1 M1 A1	or $\frac{6}{11} \times 55$ or $\frac{2}{11} \times 55$ or M2 for Won = 30 and Lost = 10
						Total 3 marks



8	(a)		$11m - 3k$	2	B2 If not B2 then award B1 for either $11m$ or $-3k$
	(b)	$2 \times 5 + 3 \times 8$ or $10 + 24$		2	M1 for substituting the values of a and b into P
			34		A1
	(c)	$16 = 2a + 3 \times 20$ or $16 = 2a + 60$	$P - 3b = 2a$	3	M1 for substituting the values of P and b into the equation or rearranging the equation $P = 2a + 3b$ for $2a$ correctly
		$16 - 60 = 2a$ $-44 = 2a$ or	$16 - 2 \times 30 = 2a$ or $16 - 60 = 2a$		M1 for rearranging the equation for $2a$ correctly or substituting the values of P and b into the correctly rearranged equation
			-22		A1
					Total 7 marks

9		$240 \div 3 (= 80)$ or $240 \div 3 \times 2 (= 160)$		4	M1 for finding the number of large ice creams or small ice creams
		'80' $\times 3.8 (= 304)$			M1 for finding the cost of large ice creams
		$(640 - '304') \div '160'$			M1 for a complete method to find the cost of a small ice cream
			2.1(0)		A1
					Total 4 marks

10	(a)	$16 : 40$ or $8 : 20$ or $4 : 10$		2	M1 for any correct cancelling or $5 : 2$
			$2 : 5$		A1 cao
	(b)		$\frac{5}{12}$	1	B1
					Total 3 marks



14	e.g. $36 \div (2 + 6) (= 4.5)$ or $36 \div \frac{2+6}{3+2+6} (= 49.5)$ oe 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 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. $\frac{16^2}{5} \times \frac{21}{8^1}$ OR $\frac{336}{40}$ oe			M1 correct cancelling OR multiplication of numerators and denominators without cancelling
	e.g. $\frac{16}{5} \times \frac{21}{8} = \frac{336}{40} = \frac{42}{5} = 8\frac{2}{5}$ or $\frac{16}{5} \times \frac{21}{8} = \frac{336}{40} = 8\frac{16}{40} = 8\frac{2}{5}$ or $\frac{16^2}{5} \times \frac{21}{8^1} = \frac{42}{5} = 8\frac{2}{5}$ 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 $\frac{42}{5}$ NB: use of decimals scores no marks
				Total 3 marks



19	eg $(36 \div 9) \times 5$ or 20 [ducks] or 20 : 36 or for writing the 3 parts of the ratio correctly eg 35 : 10 : 18 oe		3	M1 for a fully correct calculation for the number of ducks or stating 20 ducks – may be shown in a ratio – does not need to be labelled if it is clear that the number or calculation refers to the number of ducks
	“20” $\div 2 = 10$ and 10×7 oe or $\frac{36}{18} \times 35$ oe			M1 for a correct calculation to find the number of chickens. (award the M2 for 70 : 20 : 36 or a different order if intention is clear eg by labels)
	<i>Working not required, so correct answer scores full marks (unless from obvious incorrect working)</i>	70		A1
Total 3 marks				



16	(a)		a^{11}	1	B1
	(b)		w^{12}	1	B1
	(c)		$64x^{10}y^6$	2	B2 if not B2 then award B1 for 2 correct parts as part of a product eg $kx^{10}y^6$ where $k \neq 64$ or $64x^ky^6$ where $k \neq 10$ or $64x^{10}y^k$ where $k \neq 6$
	(d)	$c + 8v = t^3$		2	M1
			$t = \sqrt[3]{c+8v}$		A1 oe
					SCB1 for an answer of $t = \frac{c+8v}{3}$ oe
Total 6 marks					
17		$196 \div (9 - 5) (= 49)$ oe		3	M1
		$3 \times "49"$			M1
			147		A1 SCB1 for an answer from 34.5 – 34.6 or an answer of 42
					Total 3 marks
18		eg $\sin 65 = \frac{AB}{8.4}$ or $\frac{AB}{\sin 65} = \frac{8.4}{\sin 90}$		3	M1 for setting up a trig equation in AB
		eg $(AB =) 8.4 \sin 65$ or $(AB =) \frac{8.4 \sin 65}{\sin 90}$			M1 for a complete method
			7.61		A1 accept 7.61 – 7.613
					Total 3 marks



7	(a)	21 : 48		2	M1 or 16 : 7
			7 : 16		A1 cao
	(b)		$\frac{11}{15}$	1	B1 oe exact fraction
					Total 3 marks

8		$0.14 \times 350 (= 49)$		3	M1
		'49' + 25 or $0.14 \times 350 + 25$			M1
			74		A1
					Total 3 marks

9	(i)	$360 - (92 + 44) (= 224)$ oe or $92 + 44 + x + x = 360$ oe		3	M1
		'224' $\div 2$ or $2x = '224'$ oe			M1
			112		A1
	(ii)		Correct reason	1	B1 dep on M1 for a correct reason Angles in a quadrilateral sum to 360° (accept Angles in a quadrilateral sum to 360°)
					Total 4 marks



14	(a)	$2.6 \times 40 + 30$ oe		2	M1
			134		A1 allow 2 h 14 mins
	(b)	$2 \times 60 + 40 (= 160)$ oe		3	M1 convert 2 hours 40 minutes to minutes
		$((\text{"160"} - 30) \div 40$ or $\text{"130"} \div 40$			M1 for a complete method
			3.25		A1 oe eg $3\frac{1}{4}$ or $\frac{13}{4}$ (Note: may see use of their part (a))
					Total 5 marks

15		eg $10.5 \div (5 - 2) (= 3.5(0))$ or $\frac{5}{7} - \frac{2}{7} (= \frac{3}{7})$ or $10.5 \times \frac{5}{5-2} (= 17.5)$ or $10.5 \times \frac{2}{5-2} (= 7)$		3	M1 for finding the value of one share or the difference as a fraction or Bella's share or Millie's share
		eg $"3.5" \times 7$ or $10.5 \div "\frac{3}{7}"$ or $"17.5" + "7"$			M1 for a complete method
			24.5(0)		A1 oe eg $\frac{49}{2}$
					SCB1 for an answer of 3 and/or 7.5 oe
					Total 3 marks

16	$\frac{62.3...}{6.07...}$		2	M1 for 62.3(2) or 6.07(646...) or 10.2 or 10.3 or 10.25 or 10.26 or 10.255 or 10.256
		10.2559(6871)		A1
				Total 2 marks

9	(a)					Correct scores	2	B2 for all scores correct (B1 for 3 or 4 scores correct)	
		Spinner A							
		1	2	3					
		Spinner B	1	1	2				3
			2	2	4				6
3	3		6	9					
4	4		8	12					
(b)						$\frac{4}{12}$	1	B1 fit oe accept 0.33(33...)	
							Total 3 marks		

10	$\frac{30}{100} \times 250 (= 75)$ oe or $250 - 160 (= 90)$		3	M1
	“90” – “75” or “75” – “90”			M1
	Correct answer scores full marks (unless from obvious incorrect working)	15		A1 allow –15
		Total 3 marks		

19	$3 \times 180 (= 540)$ or $360 - [(180 - 90) + (180 - 135) + (180 - 67) + (180 - 119)] (= 51)$ or $360 - (90 + 45 + 113 + 61) (= 51)$		3	M1
	$90 + 135 + 67 + 119 + x = "540"$ oe $411 + x = "540"$ oe or $"540" - (90 + 135 + 67 + 119)$ or $3 \times 180 - (90 + 135 + 67 + 119)$ oe or $540 - 411$ or $180 - "51"$ oe			M1
	Correct answer scores full marks (unless from obvious incorrect working)	129		A1
				Total 3 marks

20	$2 : 3 : 15$ oe or 20 or $(1 : 5) \times 3$ or $(1 : 5 \Rightarrow) 3 : 15$ or $2n : 3n : 15n$ e.g. $4 : 6 : 30$ or $G(\text{reen}) = 2, O(\text{range}) = 3, Y(\text{ellow}) = 15$		3	M1
	$\frac{2}{"20"}$ 280 oe or 14×2 or $\frac{2}{"2"+ "3"+ "15"}$ 280 oe or $\frac{2n}{"2n"+ "3n"+ "15n"}$ 280 oe			M1
	Correct answer scores full marks (unless from obvious incorrect working)	28		A1 or $28 : 42 : 210$ or $28, 42, 210$ If not in this order must be labelled correctly
				Total 3 marks



20	$390 \div (8 - 2) (= 65)$ or $\frac{8}{15} - \frac{2}{15} = 390$ or $\frac{8}{15}x - \frac{2}{15}x = 390$ or $\frac{6}{15} = 390$ or $\frac{6}{15}x = 390$ oe		3	M1	M2 for $\frac{390 \times 15}{6}$ oe
	“65” $\times (2 + 5 + 8)$ oe or $\frac{1}{15} = 65$ or $\frac{1}{15}x = 65$ or $\frac{1}{5} = 195$ or $\frac{1}{5}x = 195$			M1 or for 975 seen with further work and a different answer	
	Correct answer scores full marks (unless from obvious incorrect working)	975		A1	SCB1 for 52, 130, 208 or 390, 975, 1560 (or 2925) or 97.5, 243.75, 390 (or 731.25)
				Total 3 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 4 : 7 8 : 14 12 : 21 16 : 28 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 $\frac{39 \times 4}{7} (= \frac{156}{7} = 22.8)$ or $\frac{39 \times 7}{4} (= \frac{273}{4} = 68.25)$
	$\frac{39}{7-4} \times 4$ or eg $\frac{4}{3} \times 39$ or for 52 : 91			M1 working with figures obtained from a correct method
	<i>Correct answer scores full marks (unless from obvious incorrect working)</i>	52		A1 (52 : 91 or 91 is M2 unless Alisha = 52 clearly shown in working)
Total 3 marks				



16	$12 \div (5-2) (=4)$ or $2:5=8:20$ or $A=8$ or $S=20$ or $20 \text{ eg } \frac{5}{15}x - \frac{2}{15}x = 12$ or $x=60$		3	M1 for method to find the value of one share or working with the ratio for Arjun or Simon or setting up an equation or for finding the total number of goals (= 60)	M2 for $\frac{8}{5-2} \times 12$ oe
	eg $8 \times "4"$ or $8 \times \frac{8}{2}$ or $8 + 12 + 12$ or $8 \times \frac{20}{5}$ or $20 + 12$ or $"60" \times \frac{8}{15}$			M1 for a complete method	
	Correct answer scores full marks (unless from obvious incorrect working)	32		A1 SCB1 for $\frac{8}{15} \times 12 (= 6.4)$	
				Total 3 marks	

17	$15 \times 5 + 45 \times 6 + 75 \times 8 + 105 \times 9 + 135 \times 2$ or $75 + 270 + 600 + 945 + 270$ [lower bound products are: 0, 180, 480, 810, 240] [upper bound products are: 150, 360, 720, 1080, 300]		3	M2 for correct products using midpoints (allow one error or omission) with attempt to add (M1 for products using a consistent value within range and attempt to add or for at least 4 correct products without addition)	
	Correct answer scores full marks (unless from obvious incorrect working)	2160		A1 (an answer of 72 loses the final A mark but gains M2)	
				Total 3 marks	

Question	Working	Answer	Mark	Notes
21	eg (one share of the ratio =) $120 \div 2 (= 60)$ or $120 \times \frac{3}{2} (= 180)$ or 180 (g)[butter] or 180 : 120 or for writing the 3 parts of the ratio correctly eg 18 : 15 : 10 (or 18 : 15 and 15 : 10 or S : F = 18 : 10) oe eg 3.6 : 3 : 2		3	M1 For finding the value of one share or For a fully correct calculation for amount of butter or stating 180 (g) butter – may be shown in a ratio – does not need to be labelled if it is clear that the number or calculation refers to the amount of butter
	$(3 \times "60" \div 5) \times 6$ oe or $\frac{f}{"180"} = \frac{6}{5}$ or $\frac{18}{10} \times 120$ oe eg $\frac{120}{10} \times 18$ oe or $\frac{3.6}{2} \times 120$ oe			M1 For a correct calculation to find the amount of flour Avril uses or a correct equation involving flour that if rearranged correctly would give the correct answer (award the M2 for 216 : 180 : 120 not labelled)
	Working not required, so correct answer scores full marks (unless from obvious incorrect working)	216		A1 or flour = 216 or eg s = 120, b = 180, f = 216 (but flour must be clearly labelled)
Total 3 marks				



17		48 ÷ 2 (=24)		4	M1		
		"24" ÷ 3 = 8			M1	dep	M2 for "24"× ⁵ / ₃
		"8" × 5			M1	dep	
			40		A1		
		Alternative scheme		4			
		(5) : 3 : 6 oe			M1		
		48 ÷ 6 (=8) oe			M1	dep	M2 for 48× ⁵ / ₆
		"8" × 5 oe			M1	dep	
			40	A1			
					Total 4 marks		

18	a		9, 3, (-1), -3, (-3), -1, (3)	2	B2	If not B2 then award B1 for at least 2 correct values
	b			2	M1	dep on B1 ft from (a) for at least 5 points plotted correctly
			correct graph		A1	for the correct graph (clear intention to go through all the points and which must be curved at the bottom)
					Total 4 marks	

19	$76 \div (5 + 2 - 3) (= 19)$ $5x + 2x - 3x = 76, x = 76 \div 4 (=19)$ oe			4	M1		
	$3 \times "19" (= 57)$				M1		
	"57" – 48.5(0)				M1		
			8.5(0)		A1		
					Total 4 marks		
20	a	1.04 × 3 130 000 oe			3	M2 complete method to increase salary by 4%	
				3 255 200		M1 for 0.04 × 3 130 000 oe (= 125 200)	
					A1		
	b	for 0.15 × 750 000 oe (=112 500) or 0.85 × 750 000 oe (637 500)	OR		3	M1 For method to find depreciation for 1 year or value after 1 year	OR M2 for 750 000 × 0.85 ³ (= 460 593.75) or 750 000 × 0.85 ⁴ (= 391 504.69)
		0.85 × "637 500" (= 541 875) oe 0.85 × "541 875" (= 460 593.75) oe	750 000 × 0.85 ³			M1 for completing method	(M1 for 750 000 × 0.85 ² (= 541 875))
				460 594		A1 accept 460 593 – 460 594	
						SC: if no other marks gained award M1 for 0.55 × 750 000 oe (= 412 500) or 0.45 × 750 000 oe (= 337 500)	
						accept (1 – 0.15) as equivalent to 0.85 throughout	
						Total 6 marks	



Question	Working	Answer	Mark	Notes	
20	$19.35 \div (4 + 5) (= 2.15)$		4	M1	M2 for $\frac{5}{9} \times 19.35 (= 10.75)$
	$"2.15" \times 5 (= 10.75)$			M1	
	$\frac{12 - "10.75"}{12} \times 100$ oe or $100 - \frac{10.75 \times 100}{12}$ oe			M1	
	<i>Working not required, so correct answer scores full marks (unless from obvious incorrect working)</i>	10.4		A1	accept 10.4 – 10.42 SCB1 for $\frac{5}{9} \times 12 (= 6.66...)$ oe
				Total 4 marks	



14	$(-1, -3) (0, -1) (1, 1)$ $(2, 3) (3, 5) (4, 7)$	For a correct line between $x = -1$ and $x = 4$	3	B3 for a correct line between $x = -1$ and $x = 4$ B2 for a correct straight line segment through at least 3 of $(-1, -3) (0, -1) (1, 1) (2, 3) (3, 5) (4, 7)$ or for all of $(-1, -3) (0, -1) (1, 1) (2, 3) (3, 5) (4, 7)$ plotted but not joined B1 for at least 2 correct points stated (may be in a table) or plotted or for a line drawn with a positive gradient through $(0, -1)$ or for a line with a gradient of 2
Total 3 marks				

15	e.g. $\frac{4}{10}$ or 0.4 or 25% or 0.25		4	M1 for a correct conversion
	e.g. $1 - \frac{4}{10} - \frac{1}{4} \left(= \frac{7}{20} \right)$ or $1 - "0.4" - "0.25" (= 0.35)$ or $100 - 40 - "25" (= 35)$			M1 for a complete method to find proportion of money spent on petrol
	e.g. "their $\frac{7}{20}$ ":1 or "their 0.35":1 or "their 35":100			M1 for an equivalent ratio
		7 : 20		A1 cao SC M3 for 20 : 7
Total 4 marks				



16	$1700 \div 2 (= 850)$	M2 for eg $1700 \times \frac{7}{2} (= 5950)$		4	M1 for finding the value of one share	M2 for a complete method to find the cost of Seiso's share
	“850” $\times 5 (= 4250)$ or “850” $\times (2 + 5)$ (= 5950) or 1700 + “4250” (= 5950)	or $1700 \times \frac{5}{2} (= 4250)$			M1 for finding the cost of Seiso's share or the total of Roland and Seiso's share	or the total of Roland and Seiso's share
	eg $1700 + \text{“4250”} + (1700 + 2150)$ or $\text{“5950”} + (1700 + 2150)$ or $\text{“5950”} + 3850$				M1 for a complete method	
	Correct answer scores full marks (unless from obvious incorrect working)		9800		A1 SCB1 for $1700 \div 5 (= 340)$ or $1700 \div 7 (= 242(.85\dots))$ or 243) or $2150 \div 7 (= 307(.14\dots))$ or $2150 \div 2 (= 1075)$ or $2150 \div 5 (= 430)$	
					Total 4 marks	



21	2 and 15 seen or $1 \times 2 (+) 3 \times 5 (= 17)$	$2x + 15x (= 85)$ or $\frac{2}{3}y + 5y (= 85)$ or $0.25t \times 2 + 0.75t \times 5 (= 85)$		4	M1 For 2 and 15 oe seen or 17 or a correct equation in one unknown for number of 2p coins (x) or number of 5p coins (y) or total number of coins (t)
	$85 \div (2 + 15) (= 5)$ or at least two pairs of multiples of the values of 2 and 15 (eg 4, 30; 6, 45.....) or 10(p) (and) 75(p) or 10 : 75 or 5×2 and 15×5 $2 \times 5 + 5 \times 3 \times 5$ or 20 coins	$17x = 85$ (x = 5) or $\frac{17}{3}y = 85$ (y = 15) or $4.25t = 85$ (t = 20)			M1 assumes previous M1 for number of 2p coins or number of 5p coins or total number of coins or value of 2p coins and value of 5p coins may be clearly listed eg 2 555 2 555 2 555 2 555 with no ambiguity
	5 (2p coins) and 15 (5p coins) or 5 : 15 (if clearly identified (or used) as the key ratio eg not just part of a list) or $(3 - 1) \times 5$	eg 15 – 5 oe			M1 Correct number of 2p coins and 5p coins or a sum to find the difference in number of coins
	Correct answer scores full marks (unless from obvious incorrect working)			10	A1 SCB1 if no other marks awarded for 21.25 in working or on answer line
					Total 4 marks



13	$\frac{49}{175} \times 100$ oe or 0.28×100 oe		2	M1
	<i>Correct answer scores full marks (unless from obvious incorrect working)</i>	28		A1
				Total 2 marks

14	$135 \div (2 + 7) (= 15)$ oe or $135 \div 9 (= 15)$ oe or $9 \times 15 (= 135)$ oe		4	M1	M2 for $\frac{2}{9} \times 135 (= 30)$ or $\frac{7}{9} \times 135 (= 105)$
	$2 \times "15" (= 30)$ oe or $7 \times "15" (= 105)$ oe			M1	
	$"30" \times 8 + "105" \times 5 (= 765)$ oe or $240 + 525 (= 765)$ oe			M1	
	<i>Correct answer scores full marks (unless from obvious incorrect working)</i>	65		A1	
					Total 4 marks



13	(-2, 9) (-1, 7) (0, 5) (1, 3) (2, 1) (3, -1)	For a correct line between $x = -2$ and $x = 3$	3	B3 For a correct line between $x = -2$ and $x = 3$ (B2 For a correct straight line segment through at least 3 of (-2, 9) (-1, 7) (0, 5) (1, 3) (2, 1) (3, -1) OR for all of (-2, 9) (-1, 7) (0, 5) (1, 3) (2, 1) (3, -1) plotted but not joined OR for a line drawn with a negative gradient of -2 through (0, 5)) (B1 For at least 2 correct points stated (may be in a table) OR for a line drawn with a negative gradient through (0, 5) OR for a line with a gradient of -2)				
					Total 3 marks			

14	$\frac{1}{5} \times 1200 (= 240)$ oe or $1200 \div 5 (= 240)$ oe	$20(\%)$ or 0.2 or 0.42 or $\frac{42}{100}$ oe		4	M1 M2 for 744
	$0.42 \times 1200 (= 504)$ or $\frac{42}{100} \times 1200 (= 504)$ oe	$\frac{1}{5} + \frac{42}{100} (= \frac{62}{100})$ oe or $0.2 + 0.42 (= 0.62)$ or $20 + 42 (= 62)$			M1
	$1200 - ("240" + "504") (= 456)$ oe or $1200 - "744" (= 456)$	$1 - \frac{62}{100} (= \frac{38}{100} = \frac{19}{50})$ oe or $1 - "0.62" (= 0.38)$ or $100 - "62" (= 38)$			M1
	<i>Working not required, so correct answer scores full marks (unless from obvious incorrect working)</i>		1.9		A1 oe
					Total 4 marks



12	$240 \div (5 + 3) (= 30)$	$0.64 \times 5 (= 3.2)$ or " 0.36 " $\times 5 + 3 (= 4.8)$	$0.64 \times 240 (= 153.6)$ allow 153 or 154		4	M1	M2 for $\frac{5}{8} \times 240 (= 150)$
	$5 \times "30" (= 150)$ [may see 150 : 90]	$240 \div (5 + 3) (= 30)$ or $\frac{"3.2"}{8} \left(= \frac{2}{5} \right)$ $\frac{"4.8"}{8} \left(= \frac{3}{5} \right)$ "3.2" or "4.8" must be seen previously	"153.6" $\div (5 + 3) (= 19.2)$			M1	
	$0.64 \times "150"$ or 1.5×64 $150 - 150 \times 0.36$ (150 – 54)	"3.2" $\times "30"$ or $\frac{2}{5} \times 240$ or $240 - \frac{3}{5} \times 240$	"19.2" $\times 5$			M1	For a fully correct method all figures must come from correct working
	Correct answer scores full marks (unless from obvious incorrect working)			96		A1	cao 150 – 96 (96 must be seen) is M3 (SCB2 if no other marks awarded award for 95.625 or 96.25)
						Total 4 marks	



15	eg $40 \div 5 (= 8)$ or $40 \times 8.5 (= 340)$		4	M1 for starting to work with the ratio or working out the total income from the chocolate cakes
	eg $7 \times "8" (= 56)$			M1 for method to find the number of lemon cakes
	eg $"340" + "56" \times 12.75$ or $"340" + 714$			M1 for a complete method
	<i>Correct answer scores full marks (unless from obvious incorrect working)</i>	1054		A1 cao If no other marks awarded, award SCB2 for answer of 439(.166....) SCB1 for 141(.66...) or 297(.5(0))
Total 4 marks				
16	(a)	17	1	B1 cao
	(b)		2	M1 for $\frac{6}{m}$ where $m > 6$ or $\frac{n}{25}$ where $n < 25$ or answer of 6 : 25 or 6 out of 25
	<i>Correct answer scores full marks (unless from obvious incorrect working)</i>	$\frac{6}{25}$		A1 oe eg 0.24, 24%
Total 3 marks				



Question	Working	Answer	Mark	Notes
23*	$240 \div (3 + 4 + 5) (= 20)$ or $240 \times \frac{3}{3+4+5} (= 60)$ oe or $240 \times \frac{4}{3+4+5} (= 80)$ oe or $240 \times \frac{5}{3+4+5} (= 100)$ oe		4	M1 for a correct method to find the value of one share NB $(240 \div 3 =) 80$, $(240 \div 4 =) 60$ and $(240 \div 5 =) 48$ scores M0
	For two of (Pau:) $3 \times "20" + 10 + 10 (= 80)$ or $"60" + 10 + 10 (= 80)$ (Sam:) $4 \times "20" - 10 (= 70)$ or $"80" - 10 (= 70)$ (Tia:) $5 \times "20" - 10 (= 90)$ or $"100" - 10 (= 90)$			M1 for the correct values for 2 of the people after S and T give P £10
	80, 70 and 90 or eg $9 : 7 : 8$ oe or eg $4 : 3.5 : 4.5$ oe			M1 for all 3 of 80, 70, and 90 correct (ignore units) or for the correct values for the final ratio in the wrong order (ignore units) or for the correct values for the final ratio unsimplified (ignore units)
	Working not required, so correct answer scores full marks (unless from obvious incorrect working)	8 : 7 : 9		A1 other orders are acceptable if labelled correctly on the answer line or working
Total 4 marks				

Question	Working	Answer	Mark	Notes
13	$170 \div 2 (=85)$ or $170 \div 2 \times 7 (=595)$ or $7 \div 2 (=3.5)$ $7 \times "85" + 170 (=765)$ or $9 \times "85" (=765)$ or $"595" + 170 (=765)$ or $170 \times "3.5" + 170 (=765)$ $"765" \div 3 (=255)$ or $"765" \div 3 \times 5 (=1275)$ $"255" \times 2$ or $"1275" - "765"$ or $"1275" \div 5 \times 2$	510	5	M1 M1 award of this mark implies the first M1 M1 dep on M2 M1 A1
	Alternative scheme			
	(girls =) $\frac{2}{9}$ (of children) (girls =) $\frac{2}{9} \times \frac{3}{5} \left(= \frac{2}{15} \right)$ (of total) or $G : C : A = \frac{2}{9} \times \frac{3}{5} : \frac{3}{5} : \frac{2}{5} \left(= \frac{2}{3} : 3 : 2 \right)$ $"\frac{15}{2}" \times 170 (=1275)$ or $G : A = 2 : 6$ oe $"1275" \div 5 \times 2$ or 3×170	510	5	M1 M1 award of this mark implies the first M1 M1 dep on M2 M1 A1



26	e.g. $\frac{3}{10} \times 80 (= 24)$ or $\frac{2}{10} \times 80 (= 16)$ or $\frac{5}{10} \times 80 (= 40)$		5	M2 for a complete method to find the number of chocolate cakes or lemon cakes or fruit cakes "10" comes from $3 + 2 + 5$ (M1 for correct use of the ratio e.g. $80 \div "10" (= 8)$)
	e.g. $"16" \times \frac{3}{4} \times 1.7(0) (= 20.4(0))$ or $"40" \times \frac{7}{8} \times 2.4(0) (= 84)$			M1 for a method to find the profit for lemon cakes or fruit cakes
	e.g. $"24" \times 2 (= 48)$ and $"16" \times \frac{3}{4} \times 1.7(0) (= 20.4(0))$ and $"40" \times \frac{7}{8} \times 2.4(0) (= 84)$			M1 for a method to find the profit for all 3 cakes
		152.4(0)		A1
Total 5 marks				

27	(Interior angle of octagon $\Rightarrow 180 - (360 \div 8) (= 135)$ or $\frac{(8-2) \times 180}{8} (= 135)$ or (exterior angle of octagon $\Rightarrow 360 \div 8 (= 45)$)		3	M1 correct method to find interior or exterior angle of octagon (if labelled incorrectly do not award mark)
	e.g. $\frac{(8-2) \times 180}{8} (= 135)$ and $(180 - "135") \div 2 (= 22.5)$ OR $360 \div 8 (= 45)$ and $"45" \div 2 (= 22.5)$			M1 correct method to find interior angle of hexagon and base angle of triangle.
		112.5		A1
Total 3 marks				

11	(-2, 7) (-1, 5) (0, 3) (1, 1) (2, -1) (3, -3)	Correct line between $x = -2$ and $x = 3$	3	B3 for a correct line between $x = -2$ and $x = 3$ (B2 for a correct straight line segment through at least 3 of (-2, 7) (-1, 5) (0, 3) (1, 1) (2, -1) (3, -3) or for all of (-2, 7) (-1, 5) (0, 3) (1, 1) (2, -1) (3, -3) plotted but not joined) (B1 for at least 2 correct points stated (may be in a table) or plotted or for a line drawn with a negative gradient through (0, 3) or for a line with a gradient of -2)
				Total 3 marks

12	$250 \div (2 + 3) (= 50)$			M1
	$50 \times 2 (= 100)$ or $50 \times 3 (= 150)$			M1
	$\frac{42}{100} \times '150' (= 63)$ or $0.42 \times '150'$ oe ($= 63$)			M1 (indep) for a method to find 42% of their amount for Haydn
	'100' - '63'			M1 (dep on M2) for finding difference between their amounts for Rose and Haydn
		37	5	A1
				Total 5 marks



12	ALT	$\frac{2}{2+3} \times 100 (= 40)$			M1	for method to find the percentage of £250 that Rose gives to charity
		$\frac{3}{2+3} \times 100 \times 0.42 (= 25.2)$ oe			M1	for method to find the percentage of £250 that Haydn gives to charity
		'40' – '25.2' (= 14.8)			M1	(dep M2) for method to find difference between the two percentages
		$\frac{'14.8'}{100} \times 250$ or '0.148' $\times 250$ oe			M1	
			37	5	A1	
						Total 5 marks

13		$\pi \times (18 \div 2)^2 (= 254.469\dots)$			M1	
			254	2	A1	accept 254 – 255
						Total 2 marks



24	$300 \div (7 + 5 + 3) (=20)$ clear correct use of $7 + 5 + 3 (=15)$ eg division at the end by 15 $\left(\frac{"2.8"+"1.8"}{15}\right)$ or correct use of 15 in a fraction eg $\frac{2}{5} \times \frac{7}{15}$		5	M1 (no mark for "15" unless it is used correctly) use of 7×20 or 140 or 5×20 or 100 in further work assumes this mark
	$\frac{2}{5} \times (7 \times "20") (=56)$ oe eg $0.4 \times 140 (=56)$ or $\frac{2}{5} \times 7 \left(= \frac{14}{5} = 2.8 \right)$ or eg $\frac{2}{5} \times \frac{7}{15} \left(= \frac{14}{75} = 0.186... \right)$			M1 finding $\frac{2}{5}$ of the number of birthday cards or $\frac{2}{5}$ of the share of 7 or $\frac{2}{5}$ of fraction of amount
	$0.36 \times (5 \times "20") (=36)$ or $0.36 \times 5 (=1.8)$ or eg $\frac{36}{100} \times \frac{5}{15} \left(= \frac{180}{1500} = 0.12 \right)$ oe			M1 finding 36% of anniversary cards Or 36% of the share of 5 or 36% of fraction of amount
	$\frac{"56"+"36"}{300}$ or eg $\left(\frac{"2.8"+"1.8"}{15} \right)$ or $\frac{\frac{14}{5} + \frac{9}{5}}{15}$ $"\frac{14}{75} "+" \frac{180}{1500} "$			M1 for any fraction from correct working that isn't simplified or 30.66..% or 0.3066...
		$\frac{23}{75}$		A1 cao
Total 5 marks				



11	$360 \div 3 \times 5 (= 600)$ oe		5	M1 for finding the total number of vans
	$\frac{4}{9} \times 360 (= 160)$ oe or $0.44(444\dots) \times 600 (= 160)$ oe			M1 for finding the proportion of electric cars
	$0.36 \times "600" (= 216)$ oe			M1 for finding the proportion of electric vans
	"216" – "160"			M1
		56		A1
				Total 5 marks
11 Misread 1	$\frac{3}{8} \times 360 (= 135)$ or $\frac{5}{8} \times 360 (= 225)$		3	M0
	$\frac{4}{9} \times "135" (= 60)$ oe or $0.44(444\dots) \times "135" (= 60)$ oe			M1 for finding the proportion of electric cars
	$0.36 \times "225" (= 81)$ oe			M1 for finding the proportion of electric vans
	"81" – "60"			M1
		21		A0
				Total 3 marks
11 Misread 2	$360 \div 5 \times 3 (= 216)$ oe		3	M0 for finding the total number of cars
	$\frac{4}{9} \times "216" (= 96)$ oe or $0.44(444\dots) \times "216" (= 96)$ oe			M1 for finding the proportion of electric cars
	$0.36 \times "360" (= 129.6)$ oe			M1 for finding the proportion of electric vans
	"129.6" – "96"			M1 allow 129 – 96 or 130 – 96
		33.6		A0
				Total 3 marks

24	$600 \div (9 + 4 + 2) (= 40)$ or tulip: $0.45 \times 600 (= 270)$ or crocus: $\frac{5}{8} \times 600 (= 375)$	Tulips: $0.45 \times 9 (= 4.05)$ or $0.45 \times \frac{9}{15} (= \frac{27}{100} (= 0.27))$ oe	5	M1 A correct method to find one share (360 or 160 or 80 seen implies this method mark) or 45% of 600 or $\frac{5}{8}$ of 600 or the fraction of the share that is for tulips
	Daffodils: $"40" \times 2 (= 80)$ or $\frac{2}{15} \times 600 (= 80)$ (implies 1 st M1)	Crocus: $\frac{5}{8} \times 4 (= 2.5)$ or $\frac{5}{8} \times \frac{4}{15} (= \frac{1}{6} (= 0.16))$ oe		M1 A correct method to find number of daffodils or the fraction of the share that is for crocus
	Tulip: $0.45 \times (9 \times "40") (= 162)$ or $0.45 \times 600 \times \frac{9}{15} (= 162)$ (implies 1 st M1)	Total of parts $4.05 + 2.5 + 2 (= 8.55)$ or $\frac{27}{100} + \frac{1}{6} + \frac{2}{15} (= \frac{57}{100})$ oe (implies 1 st and 2 nd M marks)		M1 A correct method to find number of yellow tulips or the total of the parts that are yellow
	Crocus: $\frac{5}{8} \times (4 \times "40") (= 100)$ or $\frac{5}{8} \times 600 \times \frac{4}{15} (= 100)$ (implies 1 st M1)	$\frac{8.55}{9 + 4 + 2} \times 600$ oe or $\frac{57}{100} \times 600$ oe (implies all previous M marks)		M1 A correct method to find number of yellow crocuses or multiplying the total of the correct shares by 600
	Correct answer scores full marks (unless from obvious incorrect working)		342	A1
				Total 5 marks

11	(a)	e.g. $1190 \times \frac{5}{7}$ oe (= 850) or $1190 \times 0.71(42857143)$ $1190 \times \frac{2}{7}$ oe (= 340) or $1190 \times 0.28(57142857)$			M1 for method to calculate cost for Calvin or cost for Jenny	M2 for $1190 \times \frac{3}{7}$ oe or $1190 \times 0.42(857143)$
		e.g. $1190 \times \frac{5}{7} - 1190 \times \frac{2}{7}$ oe or '850' – '340'			M1 for a complete method to calculate the difference in cost	
			£510	3	A1	
	(b)	e.g. 3500×0.12 oe (= 420) or 3500×0.88 oe (= 3080)			M1 for a correct method to find 12% or 88% of 3500	
		e.g. $(3500 \times 0.88) \div 220$ or $(3500 \div 220) \times 0.88$ or $(3500 - '3500 \times 0.12') \div 220$ or $(3500 - '420') \div 220$ or '3080' $\div 220$ oe			M1 for a complete method	
			14	3	A1	
						Total 6 marks



18		$120 \div (3 + 5) (= 15)$ '15' $\times 3 (= 45)$ or '15' $\times 5 (= 75)$		6	M1 M1	M2 for $\frac{3}{8} \times 120 (= 45)$ or $\frac{5}{8} \times 120 (= 75)$ oe
		'45' $\div 3 (= 15)$ or '45' $\div 3 \times 2 (= 30)$			M1	
		'75' $\times \frac{16}{25} (= 48)$ or '75' $\times \frac{9}{25} (= 27)$			M1	
		E.g. ('45' $\div 3 \times 2$) + ('75' $\times \frac{9}{25}$) oe or '27' + '30' or ('75' – '48') + ('45' – '15')			M1 for a complete method	
			57		A1	
						Total 6 marks

6	(a)(i)		34	1	B1	
	(ii)		Added 6	1	B1	accept eg add 6, +6
	(b)		76	1	B1	
	(c)		Correct explanation	1	B1	eg 467 is odd or the numbers in the sequence are even or $6n - 2$ or ..., 466, 472, ...
Total 4 marks						
7	(a)	eg 60 : 24		2	M1	for any ratio equivalent to 60 : 24 or for an answer of 2 : 5
		Correct answer scores full marks (unless from obvious incorrect working)	5 : 2		A1	
	(b)		$\frac{3}{10}$	1	B1	
	(c)	eg $20 \div 4 (= 5)$ or $20 \div 4 \times 11 (= 55)$ or $\frac{x}{11} = \frac{20}{4}$ or $\frac{x}{20} = \frac{11}{4}$		3	M1	for a correct first step
		eg $11 \times "5" + 20$ or $(11 + 4) \times "5"$			M1	for a complete method
		Correct answer scores full marks (unless from obvious incorrect working)	75		A1	
	Total 6 marks					

7	180 – 138 (= 42)		4	M1 NB If angles are on the diagram they must be from correct working and correctly assigned
	360 – (“42” + 107 + 125)			M1
	<i>Correct answer scores full marks (unless from obvious incorrect working)</i>	86		A1
		one correct reason		B1 dep on M1 for one correct reason (i) <u>Angles</u> on a straight <u>line</u> add to 180° or angles on a straight <u>line</u> add to <u>180</u> ° (ii) <u>Angles</u> in a <u>quadrilateral</u> sum to 360° or angles in a <u>quadrilateral</u> sum to <u>360</u> °
				Total 4 marks

8	(a)		$\frac{27}{80}$	1	B1 oe 0.33(75) or 33(.75)% truncated or rounded
	(b)	80 – (27 + 10) (= 43) oe or 80 – 37 (= 43) $\frac{80 - (27 + 10)}{80}$ oe or $\frac{80 - 37}{80}$		2	M1
		<i>Correct answer scores full marks (unless from obvious incorrect working)</i>	$\frac{43}{80}$		A1 oe 0.53(75) or 53(.75)% truncated or rounded NB Penalise incorrect notation once
					Total 3 marks

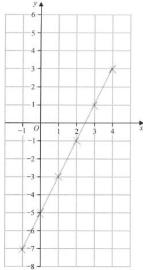
9	41.25 ÷ 15 oe or 2.75 oe or $\frac{52}{15} \times 41.25$ oe		2	M1
	<i>Correct answer scores full marks (unless from obvious incorrect working)</i>	143		A1
				Total 2 marks

10	eg $80 \times 12 \times 42 (= 40\,320)$ or $16 \times 4 \times 6 (= 384)$	eg $42 \div 6 (= 7)$ or $12 \div 4 (= 3)$ or $80 \div 16 (= 5)$ or $\frac{80 \times 12}{16 \times 4} (= 15)$ or $\frac{80 \times 42}{16 \times 6} (= 35)$ or $\frac{42 \times 12}{6 \times 4} (= 21)$		3	M1 for method to find the volume of the crate or the box or method to find the number of boxes along one dimension of the crate or for dividing the areas of corresponding faces
	“40 320” $\div$ “384”	eg “7” $\times$ “3” $\times$ “5” or “15” $\times$ “7” or “35” $\times$ “3” or “21” $\times$ “5”			M1 for a complete method to find the number of boxes
	Correct answer scores full marks (unless from obvious incorrect working)		105		A1 cao
					Total 3 marks

11	eg (1 box =) $708 \div 12 (= 59)$ or (2 boxes =) $708 \div 6 (= 118)$ or (3 boxes =) $708 \div 4 (= 177)$ or (4 boxes =) $708 \div 3 (= 236)$ or (6 boxes =) $708 \div 2 (= 354)$ or $12 \div 5 (= 2.4)$ or $708 \div \frac{12}{5}$ oe eg $708 \div 2.4$ or $708 \times \frac{5}{12}$ or $708 \times 5 (3540)$		2	M1 for starting to work with proportion
	Correct answer scores full marks (unless from obvious incorrect working)	295		A1 cao
				Total 2 marks



Question	Working	Answer	Mark	Notes	
15	SMALL $(\text{£ per g}) \frac{1.80}{1.50} (= 0.012)$ or $(\text{p per g}) \frac{180}{150} (= 1.2)$ or $(\text{g per £}) \frac{150}{1.80} (= 83.(3\dots))$ or $(\text{g per p}) \frac{1.50}{1.80} (= 0.83\dots)$ LARGE $(\text{£ per g}) \frac{5}{400} (= 0.0125)$ or $(\text{p per g}) \frac{500}{400} (= 1.25)$ $(\text{g per £}) \frac{400}{5} (= 80)$ or $(\text{g per p}) \frac{400}{500} (= 0.8)$ COMPARISON OF SAME AMOUNTS EXAMPLE eg cost of 1200 g = $\frac{1200}{150} \times 1.80 (= 14.4)$ or cost of 1200 g = $\frac{1200}{400} \times 5 (= 15)$ oe		3	M1 A start to comparing costs by finding cost per gram for either size bag or for finding grams per pound (or pence) for either size bag or for finding the cost of a weight of fudge for either size bag. M2 for a fully correct method to reach a conclusion eg $\frac{400}{150} \times 1.80 (= 4.8)$ or $\frac{150}{400} \times 5 (= 1.875)$ or $\frac{5}{1.80} \times 150 (= 416.66\dots)$ or $\frac{1.80}{5} \times 400 (= 144)$ or 300 g = £3.60 100 g = £1.20 400 g = £4.80 etc	
				M1 2 correct compatible calculations	
	Working required	Small		A1 Correct conclusion with correct values from correct working dep on M2	
				Total 3 marks	

11	(-1, -7) (0, -5) (1, -3) (2, -1) (3, 1) (4, 3) 	For a correct line between $x = -1$ and $x = 4$	3	B3 for a correct line between $x = -1$ and $x = 4$ B2 for a correct straight line segment through at least 3 of (-1, -7) (0, -5) (1, -3) (2, -1) (3, 1) (4, 3) or for all of (-1, -7) (0, -5) (1, -3) (2, -1) (3, 1) (4, 3) plotted but 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, -5) or for a line with a gradient of 2
Total 3 marks				

12	eg $\frac{42}{35}$ (=1.2) or $\frac{35}{42}$ (=0.833...) or $\frac{54}{35}$ (=1.54...) or $\frac{35}{54}$ (=0.648...)		3	M1 a method to find a correct ratio
	eg $54 \times "1.2"$ or $54 \div "0.833..."$ or $42 \times "1.54..."$ or $42 \div "0.648..."$			M1 for a complete method
	Correct answer scores full marks (unless from obvious incorrect working)	64.8		A1 accept 64.80
Total 3 marks				

7	$\frac{1}{5} \times 80 (=16)$ or $\left(1 - \frac{1}{5}\right) \times 80 (=64)$ oe		4	M1 for a method to find the number of large burgers or the number of small burgers
	"16" $\times 3$ (= 48)			M1 for a method to find the total cost of the large burgers
	$176 - "48" (=128)$			M1 for a method to find the total cost of the small burgers
	Correct answer scores full marks (unless from obvious incorrect working)	2		A1
				Total 4 marks

8	$150 \div 2 (= 75)$ or $5 \times 7 (= 35)$ or $(150 + 5 \times 2) \div 2 (= 80)$		3	M1 for a method to find the cost of the room without tax for 1 night or for a method to find the total cost of the tax for 7 nights or for a method to find the total cost of the room and the tax for 1 night
	$7 \times "75" + "35" (= 525 + 35)$ or $("75" + 5) \times 7$ or $"80" \times 7$			M1 for a complete method to find the total cost of the room and the tax for 7 nights
	Correct answer scores full marks (unless from obvious incorrect working)	560		A1
				Total 3 marks



Question	Working	Answer	Mark	Notes
14	$150 \div 6 (= 25)$ or $420 \div 6 (= 70)$ or $170 \div 6 (= 28.333...)$ or $95 \div 6 (= 15.83...)$ $755 \div "25" (= 30.2)$ and $1265 \div "70" (= 18.07...)$ and $685 \div "28.333..." (= 24.176...)$ and $950 \div "15.83..." (= 60)$		4	M1 Ingredients for 1 pie M2 dep M2 for calculations of all 4 ingredients If not M2 then M1 for 1 correct calculation
	Alt: $755 \div 150 (= 5.0333...)$ or $1265 \div 420 (= 3.0119...)$ or $685 \div 170 (= 4.029...)$ or $950 \div 95 (= 10)$ $"5" \times 6 (= 30)$ and $"3" \times 6 (= 18)$ and $"4" \times 6 (= 24)$ and $"10" \times 6 (= 60)$	18		A1 M1 M2 dep M2 for calculations of all 4 ingredients. These values do not have to be integers. If not M2 then M1 for 1 correct calculation cao (must be an integer)
		18		A1 M2 for calculations of all 4 ingredients. These values do not have to be integers. If not M2 then M1 for 1 correct calculation cao (must be an integer) 18.07 .. as a selected answer = M3 A0 Correct answer is <u>not</u> dependent on M3
				Total 4 marks

10	$72 \div 3 (= 24)$ or $\frac{x}{68} = \frac{72}{3}$		4	M1
	'24' $\times 68 (= 1632)$ or $(x =) \frac{72}{3} \times 68$ oe			M1
	'1632' $\div 60 (= 27.2)$ or $30 \times 60 (= 1800)$ or '1632' $\div 3600 (= \frac{34}{75} = 0.453(333\dots))$			M1
		Yes with correct figures		A1 Yes and 27.2 or (1632 and 1800) seen or Yes and 0.453 oe seen
				Total 4 marks

Alternative Mark Scheme for Q10 (calculation in minutes)				
10	$72 \div 60 (= 1.2)$		4	M1
	'1.2' $\div 3 (= 0.4)$			M1
	$68 \times '0.4' (= 27.2)$			M1
		Yes, with correct figures		A1 Yes and 27.2 seen
				Total 4 marks

9	(a)		107	1	B1 Accept 105 → 109
	(b)	$360 - 135$ or $180 + 45$		2	M1
			225		A1
Total 3 marks					
10	(a)	$(60 \div 24) \times 100$ or $\frac{100}{24} \times 60$		2	M1 Complete method accept 4.16×60
			250		A1 cao
	(b)	$\frac{30-24}{24} (\times 100)$ oe or $30 \div 24 (=1.25)$ or $\frac{125}{100}$ or $\frac{30}{24} (=1.25)$ or "250" or $\frac{250}{2} - 100$		2	M1 ft <i>their</i> 250 from (a)
			25		A1 cao
Total 4 marks					

11	$0.85 \times 1000 (= 850)$ or $360 \div 1000 (= 0.36)$		4	M1 for a correct conversion of kg to g or g to kg
	$360 \div 15 (= 24)$ or $"0.36" \div 15 (= 0.024)$ or $"850" \div 38 (= 22.368\dots)$ or $0.85 \div 38 (= 0.022368\dots)$ or $"850" \div 360 (= \frac{85}{36} = 2.3(6\dots))$ or $\left(\frac{38}{15}\right) 2\frac{8}{15} (= 2.5\dots)$			M1 oe
	$360 \div 15 (= 24)$ and $"850" \div 38 (= 22.368\dots)$ or $"0.36" \div 15 (= 0.024)$ and $0.85 \div 38 (= 0.022368\dots)$ or $360 \div 15 (= 24)$ and $"850" \div 24 (= 35.4\dots)$ or $"0.36" \div 15 (= 0.024)$ and $0.85 \div "0.024" (= 35.4\dots)$ or $"850" \div 360 (= \frac{85}{36} = 2.3(6\dots))$ and $"2.3(6\dots)" \times 15 (= 35.4)$ or $\left(\frac{38}{15}\right) 2\frac{8}{15} (= 2.5\dots)$ and $"2\frac{8}{15}" \times "0.36" (= 0.912)$ or $\left(\frac{38}{15}\right) 2\frac{8}{15} (= 2.5\dots)$ and $"2\frac{8}{15}" \times 360 (= 912)$ or $360 \div 15 (= 24)$ and $"24" \times 38 (= 912)$ or $"0.36" \div 15 (= 0.024)$ and $"0.024" \times 38 (= 0.912)$			M1 calculations that compare the same amounts e.g. How much flour is needed for recipe and how much Johan has for each cake or Working out how many cakes Johann can make with his flour to compare with 38 cakes or Working out how much flour is needed to enable comparison with given figure of 0.85 kg
		No and correct figures seen		A1 No or statement that clearly states that there is not enough flour to make 38 cakes and correct figures - figures may be rounded in working and produce slightly different results which are acceptable eg $"2.3(6\dots)" \times 15$ allow 34 – 36 Must compare 912 with 850 or implied by 62 seen
				Total 4 marks

11 ALT	$0.85 \times 1000 (= 850)$		4	M1
	E.g. $15 + 15 (= 30)$ or $15 \div 2 (= 7(.5)$ or 8)			M1
	E.g. $15 + 15 + 7(.5) (= 37(.5))$ or $15 + 15 + 8 (= 38)$			M1
		No and 37(.5) or 38 seen		A1 oe No and 37(.5) or 38 seen
				Total 4 marks

11 ALT	$0.85 \times 1000 (= 850)$		4	M1																		
	$360 \div 15 (= 24)$			M1																		
	E.g. for a build up method <table><tr><td>(360)</td><td>15</td></tr><tr><td>(360)</td><td>15</td></tr><tr><td>(24)</td><td>1</td></tr><tr><td>(24)</td><td>1</td></tr><tr><td>(24)</td><td>1</td></tr><tr><td>(24)</td><td>1</td></tr><tr><td>(24)</td><td>1</td></tr><tr><td>(24)</td><td>1</td></tr><tr><td>(864)</td><td>36</td></tr></table>	(360)	15	(360)	15	(24)	1	(24)	1	(24)	1	(24)	1	(24)	1	(24)	1	(864)	36			M1
(360)	15																					
(360)	15																					
(24)	1																					
(24)	1																					
(24)	1																					
(24)	1																					
(24)	1																					
(24)	1																					
(864)	36																					
		No and 36 seen		A1 oe No and 36 seen																		
				Total 4 marks																		

11	$9.2 \times \frac{500}{1000}$ or $9.2 \div 2$ (= 4.6) oe		4	M1	for a method to find the cost of 500g of Cheddar
	$6.3 - "4.6"$ (= 1.7)			M1	for a method to find the cost of 200g of Stilton
	$"1.7" \times \frac{1000}{200}$ or $"1.7" \times 5$ oe			M1	for a complete method to find the cost of 1kg of Stilton
		8.5(0)		A1	
				Total 4 marks	
12	eg $3x - 24 + 102 - x = 180$ oe or $90 + 90 + 3x - 24 + 102 - x = 360$ oe		3	M1	for setting up a correct equation
	eg $2x = 180 - 78$ oe or $2x = 360 - 258$ oe or eg $(180 + 24 - 102) \div 2$ or $360 - (90 + 90 - 24 + 102) \div 2$			M1	for simplifying and isolating the x term or for a complete calculation to find the value of x
		51		A1	
				Total 3 marks	
13 (a)	$150 \div (90 \div 18)$ oe eg $150 \div 5$		2	M1	for a complete method to find the number of people for running
				30	A1
(b)	eg $360 - (90 + 150 + 15 \times "5")$ (= 45) oe	eg $360 \div "5"$ (= 72)	3	M1	for working out the angle for swimming or the total number of people check the table for answers ft their "5" from $90 \div 18$
	$"45" \div "5"$	$"72" - (18 + 15 + "30")$		M1	for a complete method to work out the number of people for swimming ft their "5" from $90 \div 18$ ft their "30" from (a)
				9	A1
				Total 5 marks	

11	$1.4 \times 1000 (= 1400)$		4	M1
	$5 \times 250 \div 120 (= 10.4\dots)$ oe or 120, 240, 360, 480, 600, 720, 840, ... or $750 \div 60 (= 12.5)$ oe or 60, 120, 180, 240, 300, 360, 420, ... or “1400” $\div 200 (= 7)$ oe or 200, 400, 600, 800, 1000, 1200, 1400, ...	$120 \div 24 (= 5)$ oe or $60 \div 24 (= 2.5)$ oe or $200 \div 24 (= 8.3\dots)$ oe		M1
	$5 \times 250 \div 120 (\times 24)$ oe or $1250 \div 120 (\times 24)$ oe or 10.4... oe or 250 or 120, 240, 360, 480, 600, 720, 840, ... and $750 \div 60 (\times 24)$ oe or 12.5 oe or 300 or 60, 120, 180, 240, 300, 360, 420, ... and “1400” $\div 200 (\times 24)$ oe or 7 or 168 or 200, 400, 600, 800, 1000, 1200, 1400, ...	$5 \times 250 \div “5” (= 250)$ oe and $750 \div “2.5” (= 300)$ oe and “1400” $\div “8.3\dots” (= 168)$		M1
	Working required		168	A1 dep on M3
				Total 4 marks



Question	Working	Answer	Mark	Notes
16*	180 + 73 or 360 – (180 – 73) or 360 – 107 or 270 – (90 – 73) or 270 – 17 or 270 – (180 – 90 – 73)		2	M1 or for 73 or for 107 or for 253 seen in the correct place on the diagram by point B or correctly identified by labelling
	<i>Working not required, so correct answer scores full marks (unless from obvious incorrect working)</i>	253		A1
Total 2 marks				

Question	Working	Answer	Mark	Notes
17* (a)	12 ÷ 4 (= 3) or 50 ÷ 4 (= 12.5) oe		2	M1 for a correct method to find the SF or a correct calculation to find the amount of cheese for one person
	<i>Working not required, so correct answer scores full marks (unless from obvious incorrect working)</i>	150		A1
(b)	180 ÷ 40 (= 4.5) oe or 40 ÷ 4 (= 10)		2	M1 for a correct method to find the SF or a correct calculation to find the amount of butter for one person
	<i>Working not required, so correct answer scores full marks (unless from obvious incorrect working)</i>	18		A1
Total 4 marks				

15	one of: Flour - $\frac{150 \times 10}{1500} \times 1.30 (=1.30)$ Choc spread - $\frac{10 \times 250}{500} \times 2.60 (=13)$ Eggs - $\frac{3 \times 10}{6} \times 1.10 (= 5.50)$	one of Flour - $\frac{150}{1500} \times 1.30 (=0.13)$ Choc spread $\frac{250}{500} \times 2.60 (=1.30)$ Eggs $\frac{3}{6} \times 1.10 (=0.55)$		5	M1 No need for labels
	at least two of: Flour - $\frac{150 \times 10}{1500} \times 1.30 (=1.30)$ Choc spread - $\frac{10 \times 250}{500} \times 2.60 (=13)$ Eggs - $\frac{3 \times 10}{6} \times 1.10 (= 5.50)$	at least two of Flour - $\frac{150}{1500} \times 1.30 (=0.13)$ Choc spread $\frac{250}{500} \times 2.60 (=1.30)$ Eggs $\frac{3}{6} \times 1.10 (=0.55)$			M1 No need for labels
	$120 \times 0.4 (= 48)$ oe	$12 \times 0.4 (= 4.80)$			M1 indep
	(profit =) “48” – “1.30” – “13” – “5.50” or “48” – “19.80”	(profit =) 10(“4.80” – “0.13” – “1.30 – “0.55”) or 10(“4.80” – 1.98)			M1 complete method to calculate profit by subtracting 3 amounts, all of which must be correct or from correct working
			28.2(0)		A1
					Total 5 marks



17	a	$150 \div 6 \times 14$ oe		2	M1
			350		A1
	b	$630 \div 90 \times 6$ oe		2	M1
			42		A1
	c	$162 \div (2 + 7) \times 2$ oe		2	M1
			36		A1
Total 6 marks					

18	$ADC = 180 - 58 (= 122)$ or $EDF = 122$ or $CDE = 58$ or $ADF = 58$		5	M1	may be seen marked on the diagram
	e.g. $DEF = 58 \div 2$ or $DEF = (180 - 122) \div 2$			M1	complete method to find angle DEF
		29		A1	
				B2	dep on M2 for fully correct reasons for their method (B1 dep on M1 for one correct reason stated and used) e.g. <u>Allied angles</u> , <u>co-interior angles</u> , <u>Alternate angles</u> , <u>Corresponding angles</u> , <u>Vertically opposite angles</u> are equal (or <u>Vertically opposite angles</u> are equal), <u>Angles</u> on a straight line add up to 180° (or angles on a straight line add to 180°), Sum of <u>two angles</u> in a triangle are equal to <u>opposite exterior angle</u> , <u>Angles</u> in a triangle add up to 180° (or Angles in a triangle add up to 180°), Base angles in an <u>isosceles triangle</u> , <u>Angles</u> in a <u>quadrilateral</u> add up to 360. (accept "4-sided shape" or parallelogram) <u>Opposite angles</u> of a <u>parallelogram</u> are equal
Total 5 marks					

14	(a)	450 ÷ 90 (= 5) oe or 90 ÷ 6 (= 15) oe		2	M1 for a method to find the number of batches of 6 biscuits made or the amount of flour needed per biscuit
		Correct answer scores full marks (unless from obvious incorrect working)	30		A1
	(b)	84 ÷ 6 (= 14) oe or 75 ÷ 6 (= 12.5) oe		2	M1 for a method to find the number of batches of 6 biscuits made or the amount of butter needed per biscuit
		Correct answer scores full marks (unless from obvious incorrect working)	1050		A1
	(c)	624 ÷ (3 + 5) (= 78) oe or $624 \times \frac{3}{3+5}$ (= 234) or $624 \times \frac{5}{3+5}$ oe		2	M1 for a method to find the value of one part of the ratio or for a method to find the value of three parts or for a complete method
		Correct answer scores full marks (unless from obvious incorrect working)	390		A1
					Total 6 marks