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EDEXCEL INTERNATIONAL GCSE MATHS: QUESTIONS BY TOPIC

Number Operations & Properties (N1)

International GCSE Mathematics A (4MA1) · Foundation tier

122 questions · 446 marks · Mark schemes included

Past papers June 2018 - June 2025 · 4 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

122 questions · 446 marks · 4 sub-topics

SUB-TOPIC N1a

PLACE VALUE, ORDERING & THE FOUR OPERATIONS

Sub-topic N1a · 45 questions · 179 marks · lowest tariff first



14 (a) Work out $\sqrt{64 \times 36}$

(1)

(b) Work out 11^4

(1)

(Total for Question 14 is 2 marks)



3 The temperature in New York is -2°C

At the same time, the temperature in Rabat is 16°C higher than the temperature in New York.

(a) Work out the temperature in Rabat.

..... $^{\circ}\text{C}$
(1)

Also, at the same time, the temperature in Helsinki is 17°C lower than the temperature in New York.

(b) Work out the temperature in Helsinki.

..... $^{\circ}\text{C}$
(1)

(Total for Question 3 is 2 marks)



8 Masie is told that $13\,203 \div 27 = 489$

Explain how she can use this calculation to work out 489×28

.....

.....

.....

(Total for Question 8 is 2 marks)

9 (a) Simplify $6p + 2t + p - 3t$

.....
(2)

$$A = 8x - 3y$$

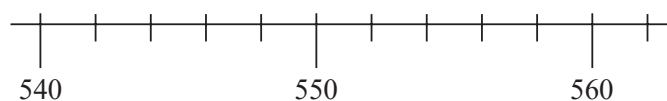
(b) Work out the value of A when $x = 5$ and $y = 4$

$A =$
(2)

(Total for Question 9 is 4 marks)



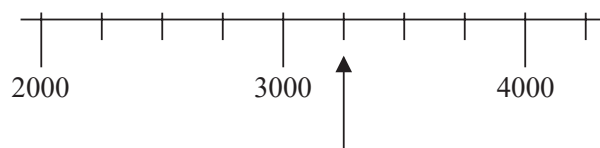
- 3 Here is a number scale.



- (a) On the scale, mark with an arrow (↗) the number 554

(1)

Here is a different number scale.



- (b) Write down the number shown marked by the arrow.

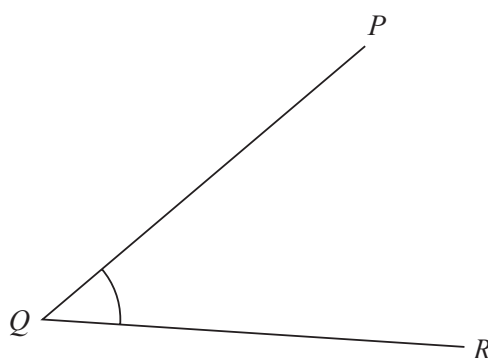
.....
(1)

(Total for Question 3 is 2 marks)

- 4 (a) In the space below, draw a line of length 6.5 cm

(1)

The diagram shows the straight lines QP and QR



- (b) Measure the size of angle PQR

.....
(1)

(Total for Question 4 is 2 marks)

- 3 The table shows the mean daytime temperature for each of five planets.

Planet	Temperature (°C)
Jupiter	−160
Mars	−30
Mercury	430
Neptune	−210
Venus	470

- (a) Which of these five planets has the lowest mean daytime temperature?

.....
(1)

- (b) Work out the difference between the mean daytime temperature for Jupiter and the mean daytime temperature for Venus.

..... °C
(1)

(Total for Question 3 is 2 marks)



3 (a) Simplify $d + d + d + d$

.....
(1)

(b) Simplify $w \times w \times w \times w \times w$

.....
(1)

(c) Solve $6x = 42$

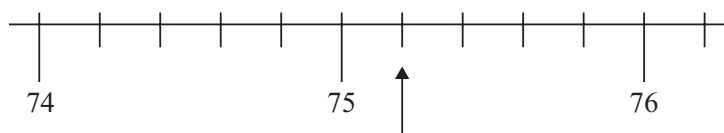
$x =$
(1)

(d) Simplify $7r + 9y + 3r - 4y$

.....
(2)

(Total for Question 3 is 5 marks)

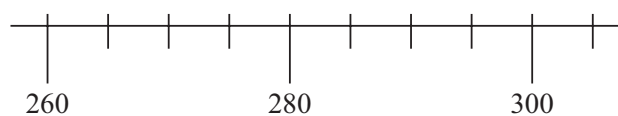
4 The diagram shows a number line.



(a) Write down the number marked with the arrow.

.....
(1)

(b) On the number line below, mark with an arrow (↑) the number 265



(1)

(Total for Question 4 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 table gives information about the lengths of five canals.

Name of canal	Length (km)
Danube-Black Sea	95.6
Kiel	98.4
Manchester	58.3
Panama	77.1
Suez	193.3

- (a) Which of these canals has the least length?

(1)

The length of the Panama Canal is 77.1 km.

- (b) Write 77.1 correct to the nearest 10

(1)

The Kiel Canal was opened on June 20th 1895

- (c) How many years old was the Kiel Canal on June 20th 2000?

years

(1)

(Total for Question 1 is 3 marks)



- 5 The table shows the temperature in each of five Canadian cities one day in January.

City	Temperature
Vancouver	6 °C
Edmonton	−8 °C
Yellowknife	−23 °C
Quebec	−20 °C
Ottawa	−5 °C

- (a) Work out the difference between the temperature in Vancouver and the temperature in Edmonton.

..... °C
(1)

The temperature in Yellowknife is lower than the temperature in Ottawa.

- (b) How much lower?

..... °C
(1)

The temperature in Winnipeg was 8 °C greater than the temperature in Quebec.

- (c) Work out the temperature in Winnipeg.

..... °C
(1)

(Total for Question 5 is 3 marks)



- 4 The table gives the minimum temperature for January 2018 in each of six cities.

City	Minimum temperature (°C)
Barcelona	3
Donetsk	−10
Mexico City	−1
Mombasa	22
New York	−15
Sydney	15

- (a) Which of these six cities has the lowest minimum temperature?

.....
(1)

- (b) Work out the difference between the minimum temperature of Donetsk and the minimum temperature of Sydney.

..... °C
(1)

The minimum temperature in Edmonton for January 2018 was 50°C less than the minimum temperature in Mombasa for January 2018

- (c) Work out the minimum temperature in Edmonton for January 2018

..... °C
(1)

(Total for Question 4 is 3 marks)



- 4 The table below shows the maximum recorded temperature and the minimum recorded temperature on one day in each of four countries.

Country	Maximum recorded temperature	Minimum recorded temperature
Morocco	19°C	11°C
Qatar	21°C	18°C
Finland	-19°C	-28°C
Canada	8°C	-40°C

- (a) Which country has the highest maximum recorded temperature?

.....
(1)

- (b) Work out the difference between the maximum recorded temperature in Finland and the minimum recorded temperature in Finland.

..... $^{\circ}\text{C}$
(1)

On the same day, the minimum recorded temperature in Japan is 15°C lower than the minimum recorded temperature in Morocco.

- (c) Work out the minimum recorded temperature in Japan.

..... $^{\circ}\text{C}$
(1)

(Total for Question 4 is 3 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 are four cards.
Each card has a number written on it.



These four cards are arranged to make the number 3457

- (a) Arrange the four cards to make the largest possible even number.

Four empty rounded rectangular boxes are shown in a row, intended for the student to place the cards to form the largest possible even number.

(1)

Darren arranges the cards to make another number.

The difference between the number 3600 and the number that Darren makes is as small as possible.

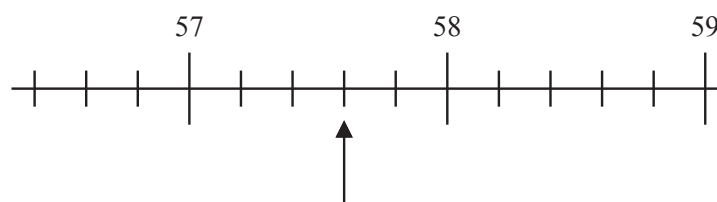
- (b) Find this difference.

(2)

(Total for Question 1 is 3 marks)



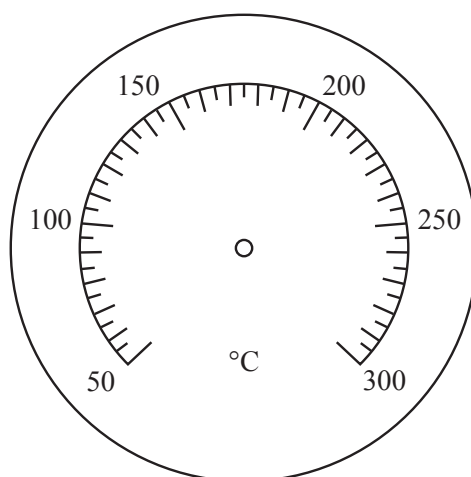
- 3 The diagram shows part of a number line.



- (a) Write down the number marked with the arrow.

.....
(1)

- (b) On the diagram below, draw an arrow to show a temperature of 240°C



(1)

- (c) Write the number 0.786 correct to 2 decimal places.

.....
(1)

(Total for Question 3 is 3 marks)

4 The table shows information about the temperatures at different heights above sea level.

Height above sea level (metres)	Temperature (°C)
14 000	−60
12 000	−58
9000	−50
7000	−40
6000	−32
4000	−17
2000	−1
0	12

(a) Work out the difference in temperature between a height of 0 m and a height of 12 000 m

..... °C
(1)

(b) Work out the difference in temperature between a height of 4000 m and a height of 6000 m

..... °C
(1)

(c) At what height is the temperature 10°C warmer than the temperature at a height of 9000 m?

..... m
(1)

(Total for Question 4 is 3 marks)

- 5 The table shows information about the shoe sizes of the 25 children in a nursery class.

Shoe size	Frequency
18	2
19	4
20	5
21	6
22	8

Find the median shoe size.

(Total for Question 5 is 2 marks)

- 6 Plates cost \$14 each.
Ben has \$250 to spend.
Ben buys as many plates as he can.
How much of the \$250 does he have left?

\$.....

(Total for Question 6 is 3 marks)



- 9 The table shows the temperatures at midnight and at midday at five ski resorts.

Ski resort	Temperature at midnight ($^{\circ}\text{C}$)	Temperature at midday ($^{\circ}\text{C}$)
Chamonix	-5	3
Alto Campoo	-8	-2
Javornik	-5	-4
La Parva	-2	-2
Asiago	-7	0

- (a) Which ski resort had the lowest temperature at midnight?

.....
(1)

- (b) Work out the increase in temperature from midnight to midday for Chamonix.

..... $^{\circ}\text{C}$
(1)

Jan knows that the temperature falls by 1°C for every 300 m increase in height above Asiago.

- (c) What was the temperature at midnight at a height 1800 m above Asiago?

..... $^{\circ}\text{C}$
(2)

(Total for Question 9 is 4 marks)



- 6 (a) Write 1782 correct to the nearest hundred.

.....
(1)

- (b) Write the number thirty two thousand and forty five in figures.

.....
(1)

Billy works out the answer to $2 + 5 \times 7$
He says that the answer is 49

Billy is not correct as the answer should be 37

- (c) Explain what Billy has done wrong.

.....
.....
(1)

Chen says,

“A prime number added to an even number always gives an odd number.”

- (d) Give an example to show that Chen is not correct.

.....
(1)

(Total for Question 6 is 4 marks)



- 5 The table gives the midnight temperatures on 1st January for five cities in the USA.

City	Midnight temperature
Boston	-5°C
Philadelphia	-4°C
Orlando	10°C
Chicago	-6°C
Phoenix	8°C

Here are the temperatures in $^{\circ}\text{C}$.

-5 -4 10 -6 8

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

(1)

- (b) Work out the difference between the midnight temperature in Orlando and the midnight temperature in Boston.

(1)

$^{\circ}\text{C}$

- (c) Work out the temperature that is exactly halfway between 8°C and -6°C .

(1)

$^{\circ}\text{C}$

On 1st January the midnight temperature in Minneapolis was 10°C lower than the midnight temperature in Philadelphia.

- (d) Work out the midnight temperature in Minneapolis.

(1)

$^{\circ}\text{C}$

(Total for Question 5 is 4 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 a number in each box so that each calculation is correct.

(i) $\boxed{} + 357 = 486$

(ii) $\boxed{} \times 23 = 1840$

(2)

Here are four cards.

Each card has a number on it.

The four cards are arranged to make the number 2745

2

7

4

5

- (b) (i) Show how the cards can be arranged to make the smallest number using all four cards.

- (ii) Show how the cards can be arranged to make an even number using all four cards.

(2)

(Total for Question 1 is 4 marks)



Answer ALL TWENTY TWO 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.
Start with the smallest number.

3 -8 1 -5 0

.....
(1)

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

2.5 2.85 2.082 2.28 2.805

.....
(1)

- (c) Find

(i) the value of $\sqrt{196}$

(ii) the cube root of 6859

.....
(2)

(Total for Question 1 is 4 marks)



Here is a diagram of a trapezium.

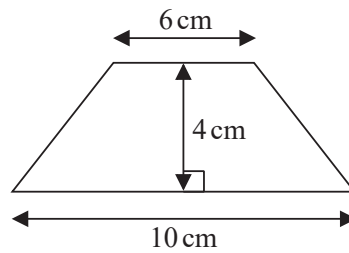


Diagram **NOT**
accurately drawn

(e) Work out the area of the trapezium.

..... cm²
(2)

(Total for Question 5 is 6 marks)

6 There are 32 children in a nursery.

Sandeep buys 5 boxes of balloons.
There are 25 balloons in each box.

Sandeep shares the balloons equally between the 32 children so that each child gets as many balloons as possible.

Work out the number of balloons that are not shared between the 32 children.

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

Answer ALL TWENTY FIVE questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

- 1** The table shows the heights, in metres, of five mountains.

Mountain	Height (metres)
Aconcagua	6961
Makalu	8485
Kilimanjaro	5895
Mont Blanc	4810
Puncak Jaya	4884

- (a) Which of these mountains has the greatest height?

.....
(1)

- (b) Write the number 5895 in words.

.....
(1)

- (c) Write down the value of the 8 in 4810

.....
(1)

- (d) Work out the difference between the height of Aconcagua and the height of Puncak Jaya.

..... metres
(1)

(Total for Question 1 is 4 marks)



- 4 The table shows the temperatures recorded at midnight and at midday for each of five North American cities on a Monday one week.

City	Midnight temperature (°C)	Midday temperature (°C)
Boston	– 2	14
Houston	11	20
Chicago	– 8	7
Detroit	– 7	– 1
New York	0	12

- (a) Which city had the lowest midnight temperature?

.....
(1)

- (b) Find the difference between the midnight temperature and midday temperature for Boston.

..... °C
(1)

From Monday to Thursday, the midday temperature in Detroit increased by 2°C each day.

- (c) Work out the midday temperature in Detroit on Thursday.

..... °C
(2)

(Total for Question 4 is 4 marks)



Answer ALL TWENTY FIVE questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

- 1** The table shows the average annual rainfall, in mm, for each of five countries.

Country	Average annual rainfall (mm)
Colombia	3240
Jamaica	2051
Brazil	1761
Japan	1668
France	867

- (a) Write the number 2051 in words.

.....
(1)

- (b) Write the number 1668 correct to the nearest hundred.

.....
(1)

The average annual rainfall for Colombia is more than the average annual rainfall for Brazil.

- (c) How much more?

..... mm
(1)

The average annual rainfall for Nigeria was 283 mm more than the average annual rainfall for France.

- (d) Work out the average annual rainfall for Nigeria.

..... mm
(1)

(Total for Question 1 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.

202 58 123 7 180

.....
(1)

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

0.155 1.5 0.15 0.015 1.15

.....
(1)

- (c) Write in figures the number five thousand two hundred and three.

.....
(1)

- (d) Write down the value of the 6 in the number 2468

.....
(1)

(Total for Question 1 is 4 marks)



6 (a) Find the value of

(i) $\sqrt{31.36}$

.....
(1)

(ii) 14^3

.....
(1)

(b) Write a number on each dotted line to make the calculation correct.

(i) $10 - \dots \times 2 = 4$

(1)

(ii) $(5 + \dots) \times 3 = 36$

(1)

(Total for Question 6 is 4 marks)



Answer ALL TWENTY FIVE questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

- 1** The table gives information about six plays written by William Shakespeare.

Play	Number of words	Year written
The Taming of the Shrew	21 055	1592
Henry V	26 119	1599
Hamlet	30 557	1602
Macbeth	17 121	1606
Julius Caesar	19 703	1599
King John	20 772	1596

- (a) Which of these six plays has the greatest number of words?

.....
(1)

Two of these six plays were written in the same year.

- (b) Write down the name of each of these plays.

..... and
(1)

The play Othello has 9329 more words in it than the play Macbeth.

- (c) Work out the number of words in the play Othello.

.....
(1)

- (d) Write the number 21 055 in words.

.....
(1)

(Total for Question 1 is 4 marks)



Answer ALL TWENTY FIVE questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

- 1 Here are four cards.
Each card has a number on it.

These four cards are arranged to make the number 5763

- (a) Arrange the four cards to make the smallest possible number.

(1)

- (b) Arrange the four cards to make the largest possible **even** number.

(1)

- (c) Arrange two of the cards to make a prime number.

(1)

- (d) Arrange two of the cards to make a multiple of 8

(1)

(Total for Question 1 is 4 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 numbers in order of size.
Start with the smallest number.

171 490 84 105 233

.....
(1)

- (b) Write in figures the number five thousand, one hundred and two.

.....
(1)

- (c) Write down the value of the 3 in the number 7439

.....
(1)

- (d) Write the number 651 correct to the nearest hundred.

.....
(1)

(Total for Question 1 is 4 marks)



15 Finn is asked to find the value of $5 + 3^2 + 12$

Here is his working and his answer.

$$\begin{aligned} 5 + 3^2 + 12 &= 8^2 + 12 \\ &= 64 + 12 \\ &= 76 \end{aligned}$$

Finn's answer is wrong.

(a) Explain what Finn has done wrong in his working.

(1)

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

$$2 \times 6 - 4^2 - 14 = 10$$

(1)

(c) Work out the value of $x^2 + 5y$ when $x = -3$ and $y = 2$

(2)

(Total for Question 15 is 4 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 table gives information about the weight of sugar produced by each of five countries in one year.

Country	Weight (tonnes)
Japan	72 900
Barbados	15 745
Kenya	592 668
Gabon	23 787
Malaysia	28 149

- (a) Write the number 28 149 in words.

.....
 (1)

- (b) Which of these five countries produced the greatest weight of sugar?

.....
 (1)

- (c) Write down the value of the 8 in the number 23 787

.....
 (1)

- (d) Write the number 15 745 correct to the nearest thousand.

.....
 (1)

(Total for Question 1 is 4 marks)



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

$$5073 \div \boxed{} = 19$$

(1)

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

$$\text{The cube root of } \boxed{} \text{ is } 14$$

(1)

Here is a list of numbers.

973 987 393 151 139

- (c) Work out the difference between the largest number in the list and the smallest number in the list.

(2)

(Total for Question 3 is 4 marks)



5 The table gives the average January temperatures for five cities.

City	Temperature
Yinchuan	−8°C
Mumbai	24°C
Tallinn	−3°C
Valencia	12°C
Saskatoon	−14°C

Here are the temperatures in °C

−8 24 −3 12 −14

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

..... (1)

- (b) Work out the difference between the January temperature in Yinchuan and the January temperature in Valencia.

..... °C
(1)

The January temperature in Winnipeg is 13°C lower than the January temperature in Tallinn.

- (c) Work out the January temperature in Winnipeg.

..... °C
(1)

The January temperature in Austin is 25°C higher than the January temperature in Saskatoon.

- (d) Work out the January temperature in Austin.

..... °C
(1)

(Total for Question 5 is 4 marks)



Answer ALL TWENTY SIX 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.

122 5 150 71 39

.....
(1)

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

0.7 0.074 3.77 0.37 0.13

.....
(1)

- (c) Write in figures the number five thousand and eighty four.

.....
(1)

- (d) Write down the value of the 3 in the number 1324

.....
(1)

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



Answer ALL TWENTY SIX questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

- 1 Write a number in each box so that each calculation is correct.

(a) $475 + \boxed{} = 1200$

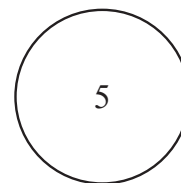
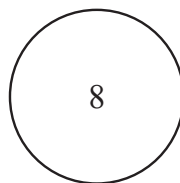
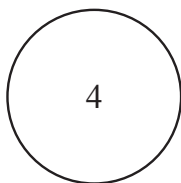
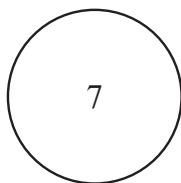
(1)

(b) $180 \times \boxed{} = 5760$

(1)

Here are four discs.

There is a number on each disc.



Using each disc only once,

- (c) (i) write down the smallest number that can be made,

.....
(1)

- (ii) write down the largest **even** number that can be made.

.....
(1)

(Total for Question 1 is 4 marks)



- 2 At 6 pm, the temperature in Victoria's garden was 5°C .
By midnight, the temperature in Victoria's garden had fallen by 9°C .

(a) Work out the temperature in Victoria's garden at midnight.

..... $^{\circ}\text{C}$
(2)

Here is a list of 7 temperatures.

4°C -6°C 4°C 0°C -1°C -7°C -5°C

(b) For the 7 temperatures in the list,

(i) write down the mode,

..... $^{\circ}\text{C}$
(1)

(ii) find the median.

..... $^{\circ}\text{C}$
(2)

(Total for Question 2 is 5 marks)



Answer ALL TWENTY SIX questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

- 1** (a) Write in figures the number **seventy thousand, two hundred and sixteen**.

.....
(1)

- (b) Write down a common factor of 20 and 30

.....
(1)

- (c) Write down a square number that is between 20 and 40

.....
(1)

- (d) Find the cube root of 3375

.....
(1)

- (e) Write brackets in the following calculation so that the answer is correct.

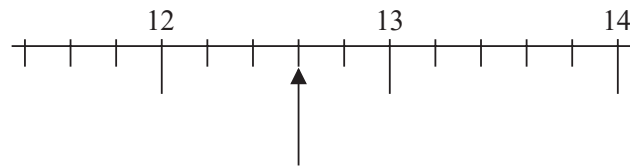
$$42 - 6 \div 6 - 3 = 40$$

(1)

(Total for Question 1 is 5 marks)



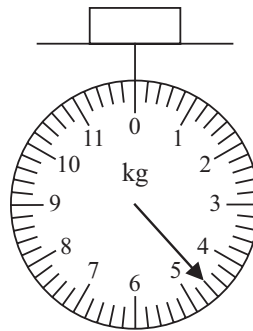
- 2 The diagram shows part of a number line.



- (a) Write down the number marked with the arrow.

.....
(1)

The diagram shows a parcel on weighing scales.



The parcel weighs less than 6 kg.

- (b) How many kilograms less?

..... kilograms
(1)

- (c) Change 7.6 metres into centimetres.

..... centimetres
(1)

- (d) Change 91 600 millilitres into litres.

..... litres
(1)

Ivan goes to the gym at 7 15 pm.

- (e) Write this time using the 24-hour clock.

.....
(1)

(Total for Question 2 is 5 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 in figures the number seven thousand and fifty four.

.....
(1)

- (b) Write the number 78 263 correct to the nearest 100

.....
(1)

- (c) Write down the value of the 7 in the number 673 000

.....
(1)

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

$$9 \times \boxed{} = 18\,000$$

(1)

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

$$53.7 \div \boxed{} = 0.005\,37$$

(1)

(Total for Question 1 is 5 marks)



Answer ALL TWENTY FOUR 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.

9 11 25 27 33 40

(a) From the numbers in the list, write down

(i) an even number

.....
(1)

(ii) a cube number

.....
(1)

Here are the temperatures, in °C, in Paris at midnight for one week.

-3 -7 -2 -6 -9 -1 -5

(b) Write down the lowest temperature.

..... °C
(1)

(c) Find the square root of 441

.....
(1)

Hassan says,

“the sum of two prime numbers is always even”

(d) Give an example to show that Hassan is **not** correct.

.....
(1)

(Total for Question 1 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** (a) Write the number 7823 correct to the nearest hundred.

.....
(1)

- (b) Write a number in each box so that each calculation is correct.

(i) $0.4 \times \boxed{} = 4000$

(1)

(ii) $3600 \div \boxed{} = 3.6$

(1)

- (c) Write down four factors of 18

.....
(1)

- (d) Which one of the following numbers is a prime number?

6 12 17 22 27

.....
(1)

(Total for Question 1 is 5 marks)



10 In a shop,

3 bottles of juice cost \$5.25

2 bottles of juice and 5 bars of chocolate cost \$9.75

Work out the cost of 5 bottles of juice and 3 bars of chocolate.

\$.....

(Total for Question 10 is 4 marks)

11 Here are five mathematical signs

+	>	=	€	<
---	---	---	---	---

(a) Write one of these five signs in each box so that each of these statements is true.

(i)

4 °C		9 °C
------	--	------

(1)

(ii)

−3 °C		−8 °C
-------	--	-------

(1)



The table gives information about the boiling points and the freezing points of some elements.

Element	Chlorine	Mercury	Neon	Oxygen
Boiling point (°C)	−35	357	−246	−183
Freezing point (°C)	−101	−39	−249	−218

(b) Which of these elements has the lowest boiling point?

.....
(1)

(c) Which of these elements has the largest difference in temperature between its boiling point and its freezing point?

.....
(1)

Dr Strauss is going to cool chlorine from its boiling point to its freezing point. He knows that it will take 2 minutes for the temperature of the chlorine to go down 10°C.

(d) Work out how long it will take the chlorine to cool from its boiling point to its freezing point?

..... minutes
(2)

(Total for Question 11 is 6 marks)

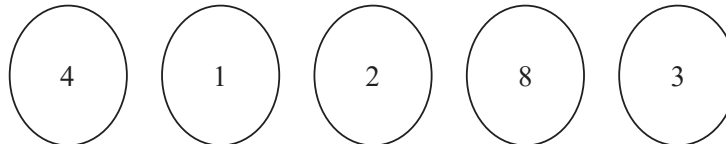


Answer ALL TWENTY ONE questions.

Write your answers in the spaces provided.

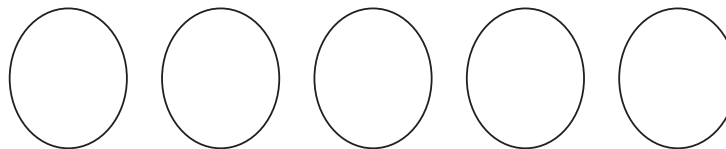
You must write down all the stages in your working.

- 1 Here are five discs.
Each disc has a number on it.



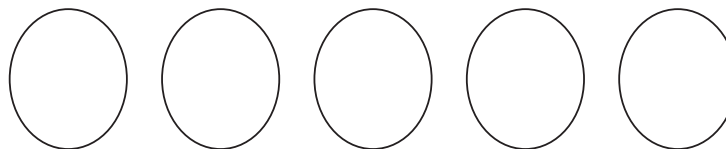
These five discs are arranged to make the number 41283

- (a) Show how all five discs can be arranged to make the smallest number.



(1)

- (b) Show how all five discs can be arranged to make the largest **even** number.



(1)

- (c) Which of the five numbers on the discs are factors of 21?

.....
(2)

- (d) Which of the five numbers on the discs are prime numbers?

.....
(2)

(Total for Question 1 is 6 marks)

- 3 (a) Write these numbers in numerical order.
Start with the smallest number.

-77 39 -89 43 -6

.....
(1)

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

0.134 0.12 0.145 0.017 0.3

.....
(1)

- (c) Write 0.7 as a percentage.

..... %
(1)

- (d) Write $\frac{27}{100}$ as a decimal.

.....
(1)

There are 60 plants on a plant stall.

$\frac{7}{10}$ of the plants are vegetable plants.

- (e) Work out how many of the plants are **not** vegetable plants.

.....
(2)

(Total for Question 3 is 6 marks)



Answer ALL TWENTY 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.

73 138 36 219 89

(1)

- (b) Write in figures the number two thousand and eighteen.

(1)

- (c) Write in words the number 4309

(1)

- (d) Write down the value of the 7 in 9715

(1)

- (e) Write the number 286 correct to the nearest 10

(1)

- (f) Work out $\frac{4}{5}$ of 185

(2)

(Total for Question 1 is 7 marks)



- 5 The table shows the temperature recorded in Amsterdam at 6 am on each of five days.

Day	Monday	Tuesday	Wednesday	Thursday	Friday
Temperature ($^{\circ}\text{C}$)	-5	-1	4	3	-6

- (a) What is the range of the temperatures in the table?

..... $^{\circ}\text{C}$
(2)

- (b) What is the median of the temperatures in the table?

..... $^{\circ}\text{C}$
(2)

- (c) What percentage of the temperatures in the table are lower than 0°C ?

.....%
(2)

On Saturday of the same week, the temperature recorded in Amsterdam at 6 am was 8°C higher than the temperature recorded at 6 am on Friday.

- (d) What was the temperature recorded in Amsterdam at 6 am on Saturday?

..... $^{\circ}\text{C}$
(2)

(Total for Question 5 is 8 marks)



SUB-TOPIC N1b

FACTORS, MULTIPLES & PRIMES

Sub-topic N1b · 55 questions · 201 marks · lowest tariff first



14 Find the lowest common multiple (LCM) of 20 and 35

(Total for Question 14 is 2 marks)

15

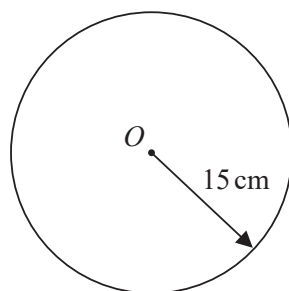


Diagram **NOT**
accurately drawn

The diagram shows a circle, centre O , with radius 15 cm.

Work out the area of the circle.

Give your answer in cm^2 correct to the nearest whole number.

..... cm^2

(Total for Question 15 is 2 marks)



..... cm²

(Total for Question 22 is 5 marks)

23

$$A = 2^3 \times 3^2 \times 5^2 \times 11$$

$$B = 2^4 \times 3 \times 5^4 \times 13$$

Find the lowest common multiple (LCM) of A and B .
Give your answer as a product of powers of prime numbers.

(Total for Question 23 is 2 marks)



21 $A = 5^3 \times 7^3 \times 11^6$ and $B = 5^6 \times 7^2 \times 11^4$

Find the highest common factor (HCF) of A and B
Give your answer as a product of powers of its prime factors.

(Total for Question 21 is 2 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 $A = 2^3 \times 5^4 \times 7 \times 11$

$$B = 2^2 \times 5^2 \times 7^2$$

$$C = 2^2 \times 5^3 \times 7^4$$

Find the highest common factor (HCF) of A , B and C
Write your answer as a product of prime factors.

(Total for Question 23 is 2 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)



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)



- 5 (a) Write down a multiple of 8 that is between 20 and 50

.....
(1)

There is only one prime number that is an even number.

- (b) Write down this number.

.....
(1)

Shreya says that 57 is a prime number.

- (c) Is Shreya correct?
Give a reason for your answer.

.....
.....
(1)

(Total for Question 5 is 3 marks)

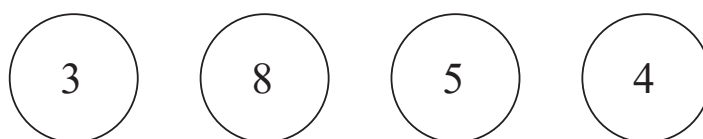


Answer ALL TWENTY FIVE questions.

Write your answers in the spaces provided.

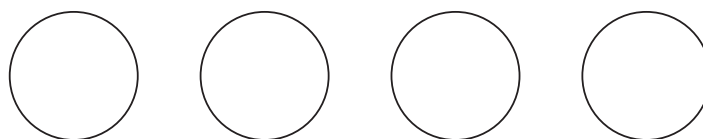
You must write down all the stages in your working.

- 1 Here are four discs.
Each disc has a number on it.



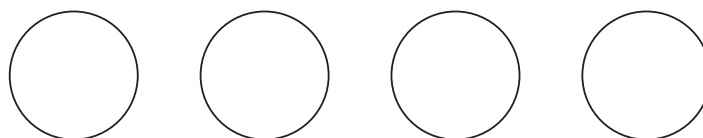
These four discs are arranged to make the number 3854

- (a) Arrange the four discs to make the largest possible number.



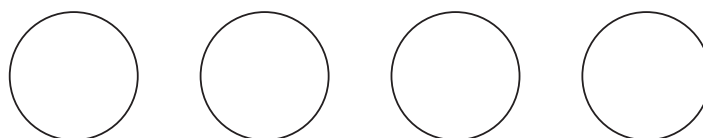
(1)

- (b) Arrange the four discs to make a multiple of 5



(1)

- (c) Arrange the four discs to make the smallest possible odd number.



(1)

(Total for Question 1 is 3 marks)



5 Here is a list of eight numbers.

10 23 27 30 42 52 74 81

From the list, write down

(i) a square number

(ii) a factor of 50

(iii) a prime number.

(Total for Question 5 is 3 marks)

6 (a) Work out the value of $\frac{9.24 \times 4.35}{6.57 + 2.19}$

Give your answer as a decimal.

Write down all the figures on your calculator display.

(2)

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

(1)

(Total for Question 6 is 3 marks)



Answer ALL TWENTY FOUR questions.

Write your answers in the spaces provided.

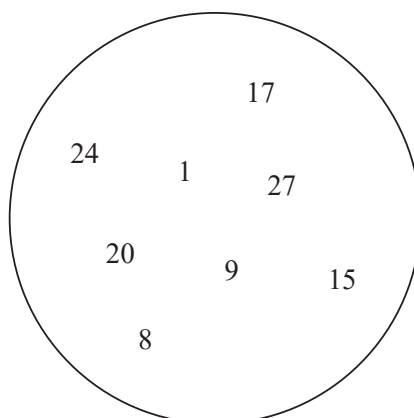
You must write down all the stages in your working.

1

3	2	6	8
---	---	---	---

- (a) Write down the largest possible four digit number using all the digits that are in the box.

.....
(1)



From the numbers in the circle, write down

- (b) a multiple of 6

.....
(1)

- (c) a prime number

.....
(1)

(Total for Question 1 is 3 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)



23 $A = 2 \times 3^{43}$
 $B = 16 \times 3^{37}$

(a) Find the highest common factor (HCF) of A and B .

.....
(1)

(b) Express the number $A \times B$ as a product of powers of its prime factors.
Give your answer in its simplest form.

.....
(2)

(Total for Question 23 is 3 marks)

TOTAL FOR PAPER IS 100 MARKS



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)



Chanthira now spins both spinners together 84 times.

- (c) Find an estimate for the number of times that spinner **A** and spinner **B** land on the same number.

.....
(2)

(Total for Question 14 is 6 marks)

- 15** Write 880 as a product of powers of its prime factors.
Show your working clearly.

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



- 13 Buses leave a bus station to go to the hospital every 16 minutes.
Buses leave the same bus station to go to the college every 20 minutes.

At 9 am a bus leaves the bus station to go to the hospital and at the same time a bus leaves the bus station to go to the college.

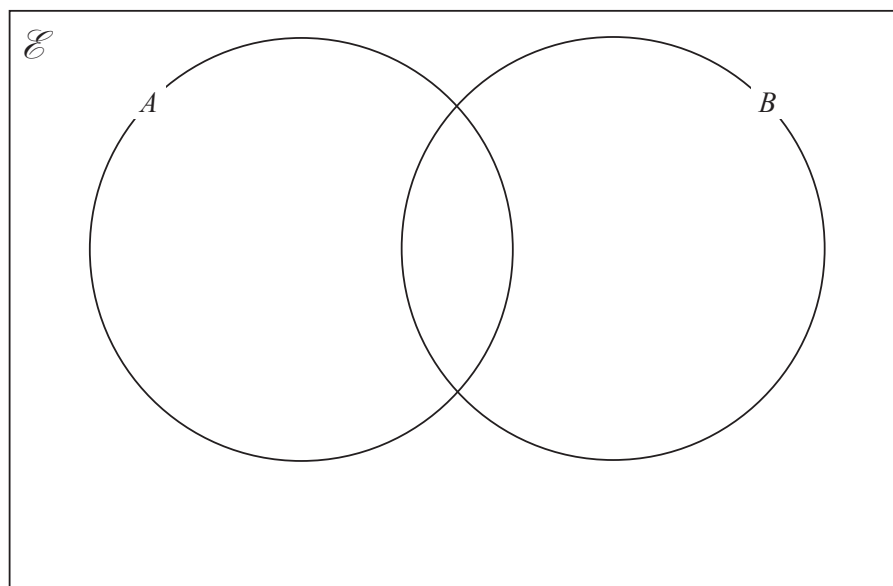
Work out the next time that a bus leaves the bus station to go to the hospital and at the same time a bus leaves the bus station to go to the college.

(Total for Question 13 is 3 marks)

- 14 $\mathcal{E} = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15\}$

$A = \{\text{even numbers}\}$

$B = \{\text{multiples of 3}\}$



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

(Total for Question 14 is 3 marks)



- 15 Write 600 as a product of powers of its prime factors.
Show your working clearly.

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



- 18** Alison buys 5 apples and 3 pears for a total cost of \$1.96
Greg buys 3 apples and 2 pears for a total cost of \$1.22

Michael buys 10 apples and 10 pears.

Work out how much Michael pays for his 10 apples and 10 pears.
Show your working clearly.

\$

(Total for Question 18 is 5 marks)

- 19** Write 3.6×10^3 as a product of powers of its prime factors.
Show your working clearly.

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



- 13** Trains leave Agra station to go to New Delhi every 40 minutes.
Trains leave Agra station to go to Mumbai every 48 minutes.

At 6 am a train leaves Agra station to go to New Delhi and at the same time a train leaves Agra station to go to Mumbai.

Work out the next time a train leaves Agra station to go to New Delhi and at the same time a train leaves Agra station to go to Mumbai.

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



- 22** Find the lowest common multiple (LCM) of 28, 42 and 63
Show your working clearly.

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



- 19 Write 1200 as a product of powers of its prime factors.
Show your working clearly.

(Total for Question 19 is 3 marks)



- 5 Zoya buys a book and some pencils.

The book costs £6.90

Each pencil costs £0.55

Zoya has a total of £15 to spend on the book and the pencils.

She buys as many pencils as she can.

Work out how many pencils she buys.

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

- 6 (a) Write down all the factors of 10

.....
(1)

- (b) Find the lowest common multiple (LCM) of 18 and 60

.....
(2)

(Total for Question 6 is 3 marks)



- 17 Write 2250 as a product of powers of its prime factors.
Show your working clearly.

(Total for Question 17 is 3 marks)



- 17 Write 1400 as a product of powers of its prime factors.
Show your working clearly.

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



- 18 Write 1400 as a product of powers of its prime factors.
Show your working clearly.

(Total for Question 18 is 3 marks)

- 19 Solve the simultaneous equations

$$3x + 2y = 10$$

$$3x - 4y = 16$$

Show clear algebraic working.

$$x = \dots\dots\dots$$

$$y = \dots\dots\dots$$

(Total for Question 19 is 3 marks)



10 (a) Find the Lowest Common Multiple (LCM) of 12 and 20

.....
(2)

(b) Find the Highest Common Factor (HCF) of 24 and 56

.....
(2)

(Total for Question 10 is 4 marks)



5 Here is a list of numbers.

12 14 15 16 18 20 22 24

(a) Which number in the list is a multiple of both 6 and 9?

(1)

Two numbers in the list are factors of 90

(b) Which two numbers?

and
(2)

(c) Write down two numbers in the list that have a sum that is a prime number.

and
(1)

(Total for Question 5 is 4 marks)



20 (a) Find the highest common factor (HCF) of 96 and 120

(2)

$$A = 2^3 \times 5 \times 7^2 \times 11$$

$$B = 2^4 \times 7 \times 11$$

$$C = 3 \times 5^2$$

(b) Find the lowest common multiple (LCM) of A , B and C .

(2)

(Total for Question 20 is 4 marks)

21 Jenny invests \$8500 for 3 years in a savings account.
She gets 2.3% per year compound interest.

How much money will Jenny have in her savings account at the end of 3 years?
Give your answer correct to the nearest dollar.

\$

(Total for Question 21 is 3 marks)



Answer ALL TWENTY THREE questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

1

3	8	16	19	24	51	60	81
---	---	----	----	----	----	----	----

From the numbers in the box, write down

(a) an odd number

.....
(1)

(b) a multiple of 12

.....
(1)

(c) a square number

.....
(1)

(d) a prime number

.....
(1)

(Total for Question 1 is 4 marks)

2 Complete the following statements by writing a number on each dotted line.

(a) A pentagon has sides.

(1)

(b) The size of each angle in an equilateral triangle is^o

(1)

(c) 1 kilometre = ... metres.

(1)

(Total for Question 2 is 3 marks)



14 (a) Find the highest common factor (HCF) of 40 and 64

.....
(2)

$$A = 2^n \times 3 \times 5^m$$

(b) Write $8A$ as a product of powers of its prime factors.

.....
(2)

(Total for Question 14 is 4 marks)



23

$$A = 3^2 \times 5^4 \times 7 \qquad B = 3^4 \times 5^3 \times 7 \times 11$$

(a) Find the highest common factor (HCF) of A and B .

.....
(2)

(b) Find the lowest common multiple (LCM) of A and B .

.....
(2)

(Total for Question 23 is 4 marks)

24 (a) Write 840 000 in standard form.

.....
(1)

(b) Work out $(6 \times 10^7) \div (8 \times 10^{-2})$
Give your answer in standard form.

.....
(2)

(Total for Question 24 is 3 marks)



15 (a) Find the highest common factor (HCF) of 28 and 70

.....
(2)

(b) Find the lowest common multiple (LCM) of 28 and 105

.....
(2)

(Total for Question 15 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 Here is a list of numbers.

1	17	21	25	26	31	39	64
---	----	----	----	----	----	----	----

From this list, write down

(a) an even number

.....
(1)

(b) a multiple of 3

.....
(1)

(c) a prime number

.....
(1)

(d) a cube number

.....
(1)

(Total for Question 1 is 4 marks)

2 (a) Change 3 litres into millilitres.

.....millilitres
(1)

(b) Change 6500 grams into kilograms.

.....kilograms
(1)

(Total for Question 2 is 2 marks)



24 $A = 2^8 \times 3^5 \times 11^4$ $B = 2^6 \times 3 \times 11^8$

(a) Find the highest common factor (HCF) of A and B .

.....
(2)

(b) Find the lowest common multiple (LCM) of $2A$ and $3B$.
Give the LCM as a product of powers of its prime factors.

.....
(2)

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



20 (a) Work out the lowest common multiple (LCM) of 36 and 120

.....
(2)

$$A = 5^2 \times 7^4 \times 11^p$$
$$B = 5^m \times 7^{n-5} \times 11$$

m , n and p are integers such that

$$m > 2$$

$$n > 10$$

$$p > 1$$

(b) Find the highest common factor (HCF) of A and B

Give your answer as a product of powers of its prime factors.

.....
(2)

(Total for Question 20 is 4 marks)



18 (a) Find the highest common factor (HCF) of 56 and 84
Show your working clearly.

.....
(2)

(b) Find the lowest common multiple (LCM) of 60 and 72
Show your working clearly.

.....
(2)

(Total for Question 18 is 4 marks)



6 Here is a list of seven numbers.

5 16 23 27 50 160 240

(a) From the numbers in the list, write down

(i) a cube number

.....
(1)

(ii) a factor of 80

.....
(1)

Two numbers in the list are prime numbers.

(b) Work out the sum of these two prime numbers.

.....
(2)

(Total for Question 6 is 4 marks)



12 (a) Show that $\frac{7}{8} - \frac{5}{12} = \frac{11}{24}$

(2)

- (b) Find the highest common factor (HCF) of 130 and 208
Show your working clearly.

(2)

(Total for Question 12 is 4 marks)



21 (a) Find the highest common factor (HCF) of 200 and 420

.....
(2)

$$A = 2^3 \times 3 \times 5 \times 7^2$$

$$B = 2 \times 3^2 \times 7$$

$$C = 3 \times 5^2 \times 11$$

(b) Find the lowest common multiple (LCM) of A , B and C
Write your answer as a product of powers of prime factors.

.....
(2)

(Total for Question 21 is 4 marks)



- 23 (a) Write 300 as a product of its prime factors.
Show your working clearly.

.....
(2)

$$A = 2 \times 2 \times 2 \times 3 \times 3 \times 5$$

$$B = 2 \times 2 \times 3 \times 3 \times 3 \times 5$$

- (b) Find the lowest common multiple (LCM) of $5A$ and $7B$
Show your working clearly.

.....
(2)

(Total for Question 23 is 4 marks)



7 (a) Simplify $6a \times 2c$

.....
(1)

(b) Simplify $4d + 3e + d - 5e$

.....
(2)

(c) Solve $4x - 7 = 23$

$x =$
(2)

(Total for Question 7 is 5 marks)

8 (a) Write down the prime number that lies between 90 and 100

.....
(1)

(b) Find the cube root of 79 507

.....
(1)

(c) Work out the value of $4^2 \times 5^3$

.....
(2)

(Total for Question 8 is 4 marks)



2 Here is a list of numbers.

9 11 13 15 21 60

From the numbers in the list, write down

(a) the even number

.....
(1)

(b) the square number

.....
(1)

(c) the multiple of 7

.....
(1)

(d) the factor of 30

.....
(1)

(Total for Question 2 is 4 marks)



Answer ALL TWENTY FIVE questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

1

20	21	23	25	27	29
----	----	----	----	----	----

From the numbers in the box, write down

(a) (i) the even number,

.....
(1)

(ii) the square number.

.....
(1)

prime	square	cube	factor	product
-------	--------	------	--------	---------

(b) Complete the following statements by writing a suitable word from the box on each of the dotted lines.

(i) 343 is the of 7

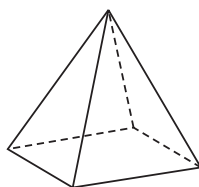
(1)

(ii) 9 is a of 63

(1)

(Total for Question 1 is 4 marks)

2 Here is a solid shape.



(a) Write down the number of edges of this shape.

.....
(1)

17 Sandeep wants to buy some packets of pens and some boxes of pencils for his stationery shop.

Each packet of pens contains 9 pens.

Each box of pencils contains 12 pencils.

Each packet of pens costs £7.60

Each box of pencils costs £4.80

Sandeep can only buy full packets of pens and full boxes of pencils.

He wants to buy exactly the same number of pens as pencils.

Work out the minimum amount Sandeep needs to pay.

£.....

(Total for Question 17 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.

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

(1)

(Total for Question 2 is 2 marks)



24 $N = 480 \times 10^9$

(a) Write N as a number in standard form.

(1)

(b) Write N as a product of powers of its prime factors.
Show your working clearly.

(3)

(c) Find the largest factor of N that is an odd number.

(1)

(Total for Question 24 is 5 marks)



18 (a) Find the highest common factor (HCF) of 21 and 35

.....
(1)

(b) Write 720 as a product of its prime factors.
Show your working clearly.

.....
(3)

(c) Find the smallest whole number that 720 can be multiplied by to give a square number.

.....
(1)

(Total for Question 18 is 5 marks)



Answer ALL TWENTY FOUR 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 in a box.

6	8	17	36	44	76	91
---	---	----	----	----	----	----

From the numbers in the list, write down

- (a) a multiple of 11

.....
(1)

- (b) a factor of 30

.....
(1)

- (c) a square number

.....
(1)

- (d) a prime number

.....
(1)

- (e) two numbers whose sum is 84

..... and
(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

8	9	17	35	48	80
---	---	----	----	----	----

From the numbers in the box, write down

(a) a factor of 40

.....
(1)

(b) a multiple of 7

.....
(1)

(c) a prime number

.....
(1)

(d) a square number

.....
(1)

(e) the two numbers with a difference of 31

..... and
(1)

(Total for Question 1 is 5 marks)



Answer ALL TWENTY FOUR questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

1

10	15	23	25	27	28	33	35
----	----	----	----	----	----	----	----

(a) From the numbers in the box, write down

(i) an even number

.....

(ii) a multiple of 9

.....

(iii) a prime number

.....

(3)

Here are four cards.

Each card has a number on it.

The four cards are arranged to make the number 7358

7	3	5	8
---	---	---	---

(b) (i) Show how the four cards can be arranged to make the smallest number using all four cards.

--	--	--	--

(ii) Show how the four cards can be arranged to make a correct calculation below.

		+			=	95
--	--	---	--	--	---	----

(2)

(Total for Question 1 is 5 marks)



5 Here is a list of numbers.

3 6 7 8 11 25 27

(a) From the numbers in the list, write down

(i) an even number

.....
(1)

(ii) a multiple of 9

.....
(1)

(iii) a square number

.....
(1)

(iv) a prime number

.....
(1)

(b) Use brackets to make the statement correct.

You may use more than one pair of brackets in the statement.

$$2^2 + 5 \times 2 + 3^2 = 99$$

(1)

(Total for Question 5 is 5 marks)

6

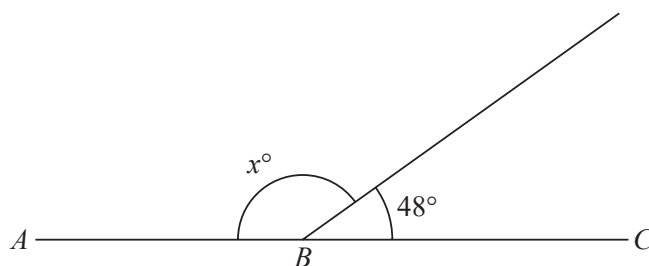


Diagram **NOT**
accurately drawn

ABC is a straight line.

(a)(i) Work out the value of x

$x =$
(1)

(ii) Give a reason for your answer to (i)

.....
(1)



Answer ALL TWENTY FIVE 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.

2 8 14 15 16 18 20

From this list, write down

(a) the odd number

.....
(1)

(b) the multiple of 6

.....
(1)

(c) the square number

.....
(1)

(d) the prime number

.....
(1)

(e) two numbers with a sum of 26

.....
(1)

(Total for Question 1 is 5 marks)



5 Here is a list of numbers.

2 8 9 18 24 28

(a) From the numbers in the list, write down

(i) an odd number

.....
(1)

(ii) a number that is a multiple of both 4 and 6

.....
(1)

(iii) a cube number

.....
(1)

(iv) a prime number

.....
(1)

(b) Work out the value of

$$6^2 + 2^3 \times 5$$

.....
(1)

(Total for Question 5 is 5 marks)



7 (a) Write down the prime number between 90 and 100

(1)

(b) Find the value of 3^6

(1)

(c) Find the cube root of 6859

(1)

(d) (i) Work out the value of $\frac{\sqrt{8.4 + 9.1^2}}{4.1 \times 0.6}$

Write down all the figures on your calculator display.

(2)

(ii) Write your answer to part (d) (i) correct to 1 decimal place.

(1)

(Total for Question 7 is 6 marks)



2 Here is a list of numbers.

3 8 9 14 23 28 30

(a) From the numbers in the list, write down

(i) a cube number

.....
(1)

(ii) a factor of 70

.....
(1)

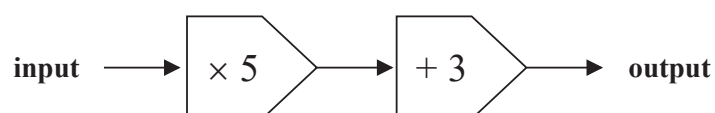
(iii) a multiple of 6

.....
(1)

(iv) a prime number.

.....
(1)

Here is a number machine.



(b) Work out the input when the output is 108

.....
(2)

(Total for Question 2 is 6 marks)

SUB-TOPIC N1c

COUNTING & SYSTEMATIC LISTING

Sub-topic N1c · 10 questions · 21 marks · lowest tariff first



6 Steve throws a 6-sided dice.

The dice can land on 1 or on 2 or on 3 or on 4 or on 5 or on 6

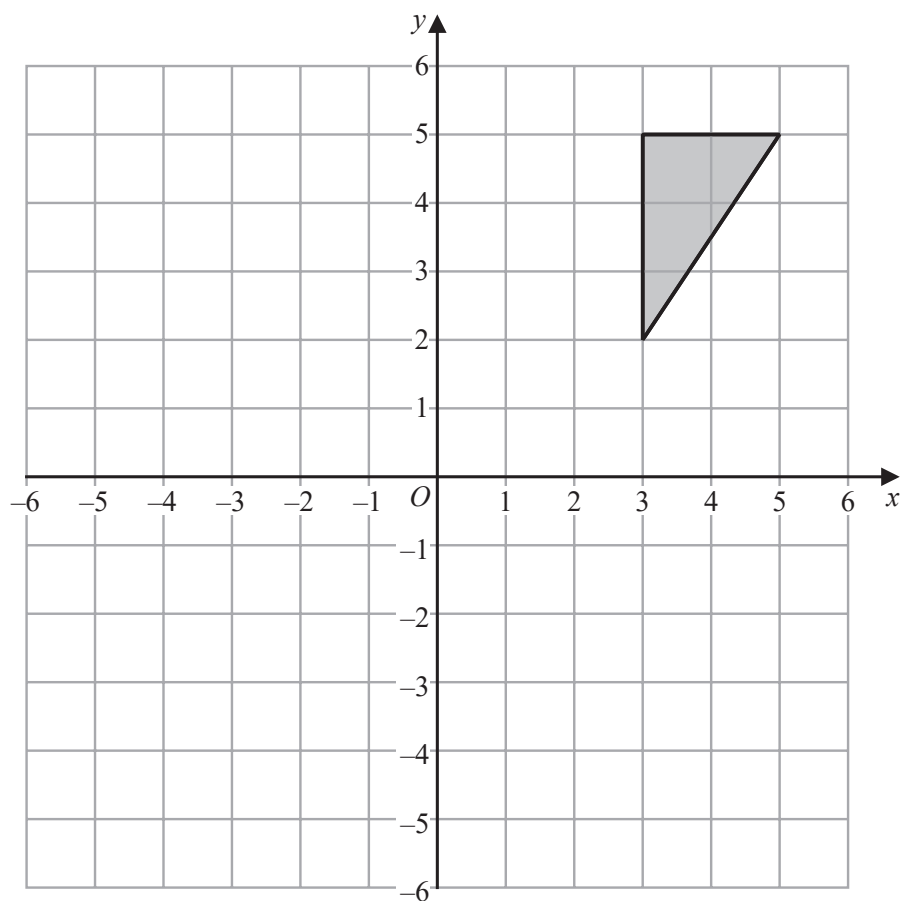
He also spins a coin.

The coin can land on heads (H) or on tails (T).

List all the possible combinations he could get.

(Total for Question 6 is 2 marks)

7



Reflect the shaded triangle in the line $y = 1$

(Total for Question 7 is 2 marks)



Liz says that in Pattern number n , the number of tiles is $2n$.

(d) Is Liz correct?

You must give a reason for your answer.

(1)

(Total for Question 4 is 5 marks)

5 Paul is buying a sandwich and a drink in a meal deal.

He can have a cheese sandwich (C) or an egg sandwich (E) or a tomato sandwich (T).

He can have orange juice (O) or milk (M) or water (W) to drink.

Write down all the possible combinations Paul can buy.

(Total for Question 5 is 2 marks)



- 6 The cost of a mobile phone in the UK is £350
The cost of an identical mobile phone in India is 28 938 rupees.

The exchange rate is £1 = 91 rupees.

The cost of the mobile phone in the UK is more than the cost of the mobile phone in India.

Work out how much more.

(Total for Question 6 is 3 marks)

- 7 Hassan is going to eat at a restaurant.
Here is the menu at the restaurant.

Starter	Main course
Fruit (F)	Burger (B)
Prawns (P)	Curry (C)
Soup (S)	Lasagne (L)
	Risotto (R)

Hassan is going to choose one starter and one main course from the menu.

List all the possible combinations that Hassan can choose.

(Total for Question 7 is 2 marks)



10 In a library there are two trolleys of books.

On trolley 1 the subjects of the books are Buildings (B), Rivers (R) and Space (S).

On trolley 2 the subjects of the books are Buildings (B), History (H) and Animals (A).

Tomos takes one book from trolley 1 and one book from trolley 2

Write down all the possible combinations of subjects that Tomos can take.

(Total for Question 10 is 2 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)



12 Ingrid buys a bag in Sweden.

The price of the bag is 1342 Swedish Krona.

The price of an identical bag in Finland is 125 euros.

Using an exchange rate of

$$1 \text{ euro} = 11 \text{ Swedish Krona}$$

work out how much cheaper the bag is in Sweden than it is in Finland.

You must give the units of your answer.

(Total for Question 12 is 3 marks)

13 Hazel is buying a snack and a drink.

She can have a bar of chocolate (*B*) or some fruit (*F*) or a packet of crisps (*C*) as her snack.

She can have orange juice (*O*) or apple juice (*A*) or water (*W*) as her drink.

Write down all the possible combinations Hazel can have.

(Total for Question 13 is 2 marks)



8 Linford is going to take part in an athletics competition.
He can choose one event from List A and one event from List B

List A	List B
Discus (<i>D</i>)	Long Jump (<i>L</i>)
Hammer (<i>H</i>)	Pole Vault (<i>P</i>)
Javelin (<i>J</i>)	Relay (<i>R</i>)
Shot Put (<i>S</i>)	

Write down all the possible combinations Linford can choose.

(Total for Question 8 is 2 marks)



8 There are four teams in a cricket competition.

The teams are

Australia (<i>A</i>)	England (<i>E</i>)	Pakistan (<i>P</i>)	West Indies (<i>W</i>)
------------------------	----------------------	-----------------------	--------------------------

Each team will play every other team once.

Write down all the matches that will take place.

.....

.....

.....

(Total for Question 8 is 2 marks)



12 Shane buys a clock in Australia.

The clock costs 232 Australian dollars.

In India, an identical clock costs 12 420 Indian rupees.

The exchange rate is 1 Australian dollar = 54 Indian rupees

The clock costs more in Australia than in India.

Work out how much more.

You must give the units of your answer.

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

13 Tom wants to knit an item for a baby.

He can knit a jumper (J) or a blanket (B) or a hat (H) or some socks (S)

He can knit using white wool (W) or using yellow wool (Y)

Tom chooses one item to knit and chooses one colour of wool.

Write down all the possible combinations for the item that Tom could knit.

.....
.....
.....
(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)



SUB-TOPIC N1d

SETS & VENN DIAGRAMS (SET NOTATION)

Sub-topic N1d · 12 questions · 45 marks · lowest tariff first



20 $\mathcal{E} = \{20, 21, 22, 23, 24, 25, 26, 27, 28, 29\}$

$A = \{\text{odd numbers}\}$

$B = \{\text{multiples of 3}\}$

List the members of the set

(i) $A \cap B$

.....
(1)

(ii) $A \cup B$

.....
(1)

.....
(Total for Question 20 is 2 marks)



17 $\mathcal{E} = \{11, 12, 13, 14, 15, 16, 17, 18, 19, 20\}$

$A = \{\text{even numbers}\}$

$B = \{\text{multiples of 3}\}$

List the members of the set

(i) $A \cap B$

(ii) $A \cup B$

(iii) A'

(Total for Question 17 is 3 marks)



17 $B = \{b, l, u, e\}$

$G = \{g, r, e, y\}$

$W = \{w, h, i, t, e\}$

(a) List all the members of the set

(i) $B \cup G$

(ii) $W \cap G'$

(2)

Serena writes down the statement $B \cap G \cap W = \emptyset$

(b) Is Serena's statement correct?

You must give a reason for your answer.

(1)

(Total for Question 17 is 3 marks)



14 $\mathcal{E} = \{21, 22, 23, 24, 25, 26, 27, 28, 29, 30\}$

$$A = \{22, 24, 26, 28, 30\}$$

$$B = \{21, 24, 27, 30\}$$

(a) List the members of the set

(i) $A \cap B$

.....

(ii) A'

.....

(2)

$$C = \{23, 25, 29\}$$

(b) Using set notation, find an expression for C in terms of A and B .

.....

(1)

(Total for Question 14 is 3 marks)

15 (a) Simplify $(3k^2)^4$

.....

(2)

(b) Simplify $(21m^4n) \div (3n^{-5})$

.....

(2)

(Total for Question 15 is 4 marks)



18 $\mathcal{E} = \{\text{letters of the alphabet}\}$

$$B = \{\text{b, r, a, z, i, l}\}$$

$$I = \{\text{i, r, e, l, a, n, d}\}$$

(a) List the members of the set

(i) $B \cup I$

(ii) $B \cap I'$

(2)

$$K = \{\text{k, e, n, y, a}\}$$

Cody writes down the statement $B \cap K = \emptyset$

Cody's statement is wrong.

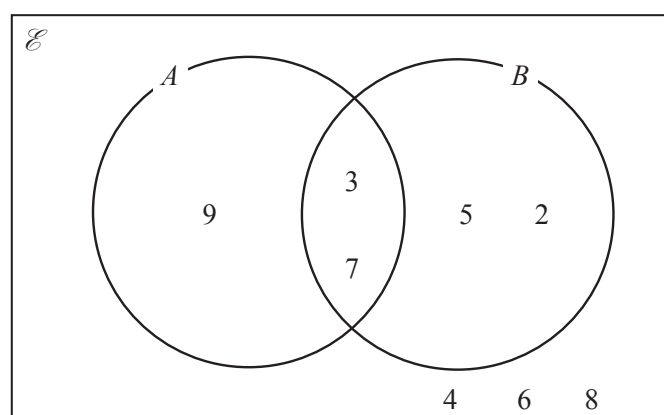
(b) Explain why.

(1)

(Total for Question 18 is 3 marks)



21 Here is a Venn diagram.



(a) List the members of the set B

(1)

(b) List the members of the set $A \cap B$

(1)

(c) List the members of the set A'

(1)

(Total for Question 21 is 3 marks)

14 $\mathcal{E} = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$

$$A = \{2, 3, 5, 7\}$$

$$B = \{4, 6, 8, 10\}$$

(a) Explain why $A \cap B = \emptyset$

.....

.....

..... (1)

$$x \in \mathcal{E} \text{ and } x \notin A \cup B$$

(b) Write down the **two** possible values of x .

....., ... (1)

Set C is such that

$$A \cup B \cup C = \mathcal{E}$$

$$A \cap C = \{2\}$$

$$B \cap C' = \{4, 6, 10\}$$

(c) List all the members of set C .

..... (2)

(Total for Question 14 is 4 marks)



20 $\mathcal{E} = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12\}$

$$A = \{2, 4, 6, 8, 10, 12\}$$

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

$$C = \{1, 3, 5, 7, 9, 11\}$$

(a) List the members of the set

(i) $A \cup B$

(ii) B'

(2)

$$\mathcal{E} = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12\}$$

$$A = \{2, 4, 6, 8, 10, 12\}$$

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

$$C = \{1, 3, 5, 7, 9, 11\}$$

$\mathcal{E}$ $\cap$ $\cup$ $\emptyset$ $\in$ $\notin$

(b) Write a symbol from the box on each dotted line to make each of the following a true statement.

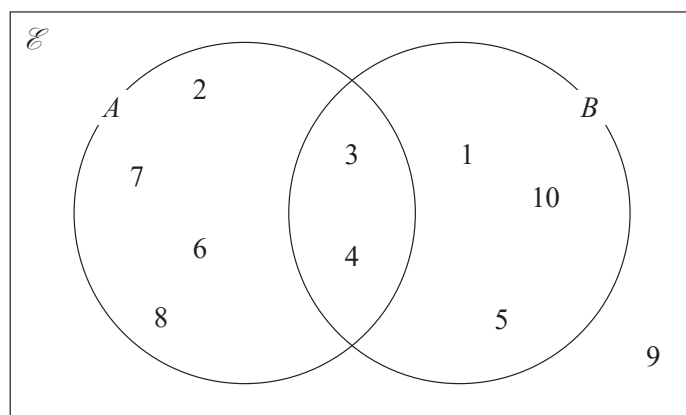
(i) $A \cap C = \dots\dots\dots$

(ii) $13 \dots\dots\dots \mathcal{E}$

(2)

(Total for Question 20 is 4 marks)

12 The Venn diagram shows the numbers in the universal set, $\mathcal{U}$, and two sets A and B .



(a) List the members of the set

(i) A

(ii) $A \cap B$

(iii) A'

(3)

A number is picked at random from the universal set.

(b) Find the probability that this number is in set B but not in set A .

(2)

(Total for Question 12 is 5 marks)

21 $\mathcal{E} = \{9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20\}$

$A = \{\text{multiples of 3}\}$

$B = \{\text{odd numbers}\}$

(a) List the members of the set

(i) $A \cap B$

(1)

(ii) $A \cup B$

(1)

(b) Is it true that $24 \in A$?

Tick one of the boxes below.

Yes

No

☐
☐

Give a reason for your answer.

(1)

Set C has 4 members such that $C \cap B' = \{10, 18\}$

(c) List the members of one possible set C

(2)

(Total for Question 21 is 5 marks)



22 $\mathcal{E} = \{23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34\}$

$A = \{\text{even numbers}\}$

$B = \{23, 29, 31\}$

$C = \{\text{multiples of } 3\}$

(a) List the members of the set

(i) $B \cup C$

(1)

(ii) $A' \cap C$

(1)

(b) Is it true that $B \cap C = \emptyset$?

Tick (✓) one of the boxes below.

Yes

No

☐
☐

Give a reason for your answer.

(1)

The set D has 4 members and is such that $D \cap (A \cup C) = \emptyset$

(c) List the members of set D

(2)

(Total for Question 22 is 5 marks)



20 $\mathcal{E} = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$

$A = \{\text{factors of } 6\}$

$B = \{\text{prime numbers}\}$

(a) List the members of the set

(i) $A \cup B$

.....
(1)

(ii) A'

.....
(1)

Harpreet states that $A \cap B = \emptyset$

Harpreet is incorrect.

(b) Explain why.

.....
(1)

C is a set with 4 members such that

the set $A \cap C$ has 2 members

the set $B \cap C$ has 2 members

Set $A \cap C$ and set $B \cap C$ have no members in common.

(c) List the 4 members of set C

.....
(2)

(Total for Question 20 is 5 marks)



MARK SCHEMES

official mark schemes, in the same order as the questions



Question	Working	Answer	Mark	Notes
12	e.g. $16s + 28s + 35s (= 79s)$ $6 \text{ min} + 4 \text{ min} + 4 \text{ min} + "79s" (= 15 \text{ min } 19s)$ $20 \text{ min} - "15 \text{ min } 19s"$	4 41	3	M1 Complete method to find the time taken by the three songs M1 (dep) A1
13 (a)	$-9, (-7), -5, -3, (-1), (1), 3$	Table	2	B2 all correct (B1 2 or 3 correct)
(b)		Correct line	2	M1 for at least 5 of their points plotted correctly (ft if at least B1 earned in (a)) A1
(c)		$\times$ P in a correct place	2	M1 for a point marked above their line or for a point marked to the left of $x = 2$ A1 for a point marked above their line and marked to the left of $x = 2$ (SC B1 for the correct region identified but no point plotted)
14 (a)		48	1	B1
(b)		14 641	1	B1

3	(a)		14	1	B1
	(b)		−19	1	B1
					Total 2 marks
4	(a)	$0.3 \times 30 (= 9)$ 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 $(1 - 0.63...) \times 30$			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

8		add 489 to 13 203	2	B2	oe eg accept $489 + 13\ 203$ (B1 for sight of $489 \times 27 = 13\ 203$)
					Total 2 marks
9	(a)	$7p - t$	2	B2	Fully correct answer (allow $-1t$) (B1 for $7p$ or $-t$)
	(b)	eg $8 \times 5 - 3 \times 4$ or $40 - 12$	2	M1	for a complete method
		28		A1	
					Total 4 marks
10	(a) (i)		35	1	B1 if answer line is blank, check the diagram
	(ii)	<u>vertically opposite</u> angles are equal or <u>vertically opposite angles</u> are equal		1	B1
	(b) (i)	$(BEC =) 180 - 90 - 35 (= 55)$ or $(BEH =) 35 + 90$		2	M1 for a method to find angle BEC or BEH
			125	A1	if answer line is blank, check the diagram
	(ii)	eg <u>Angles</u> in a <u>triangle</u> add to 180° (allow angles in a <u>triangle</u> add to 180°) <u>Angles</u> in a <u>triangle</u> sum to 180° (allow angles in a <u>triangle</u> sum to 180°) <u>Angles</u> on a <u>straight line</u> add to 180° (allow angles on a <u>straight line</u> add to 180°) The <u>exterior angle</u> of a triangle is <u>equal</u> to the sum of the <u>interior opposite angles</u>		1	B1 (dep on M1) for one correct reason
					Total 5 marks



3	(a)		554 correctly indicated	1	B1 Arrow or other mark shown clearly at 554 (2nd notch to right of 550)
	(b)		3250	1	B1
					Total 2 marks
4	(a)		line of length 6.5 cm drawn	1	B1 ± 2 mm
	(b)		44	1	B1 Accept answers in the range 42-46 including decimals and fractions
					Total 2 marks



International GCSE Maths				
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)(i)		20	1	B1 cao
(ii)		25	1	B1 cao
(b)(i)		cube	1	B1 ignore misspelling
(ii)		factor	1	B1 ignore misspelling
				Total 4 marks
2 (a)		8	1	B1 cao
(b)		Correct shape drawn	1	B1
(c)		2	1	B1 cao
(d)		240	1	B1 cao
				Total 4 marks
3 (a)		Neptune	1	B1 cao allow -210
(b)		630	1	B1 allow -630
				Total 2 marks
4 (a)(i)		(2, 6)	1	B1 cao
(ii)		(-4, 3)	1	B1 cao
(b)		Cross at (4, 2)	1	B1 cao
				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				



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
		80	1	B1
		105	1	B1
2 (a)		$\frac{1}{10} \frac{1}{6} \frac{1}{2} \frac{3}{4}$	1	B1
		0.25	1	B1
		20	1	B1
		$\frac{3}{8}$	1	B1 accept 0.375
3 (a)		3.5	1	B1 3.3 - 3.7
		Q marked	2	B2 for a correct point (B1 for angle or distance correct)



5	(a)		14	1	B1 Allow -14
	(b)		18	1	B1 Allow -18
	(c)		-12	1	B1
					Total 3 marks
6	(a)		tangent	1	B1
	(b)		Radius drawn	1	B1 Intention clear – do not accept diameter
	(c)		230	1	B1
					Total 3 marks
7		$4 \times 2.40 + 1.20 + 5.75 (= 16.55)$		3	M1 or subtracting 2 of 4×2.40 , 1.20, 5.75 from 20 or $20 - 5.75 (= 14.25)$ and $4 \times 2.40 + 1.20 (= 10.8(0))$
		$20 - (4 \times 2.40 + 1.20 + 5.75) (= 3.45)$			M1 or "14.25" – "10.8(0)" (= 3.45)
			1.15		A1
					Total 3 marks
8	(a)		$4a$	1	B1
	(b)		$15c^2$	1	B1
	(c)		$8e + 3g$	2	B2 B1 for 8e or 3g seen
	(d)		23	1	B1
	(e)		$5(y + 3)$	1	B1
	(f)	$H + w = 3y$ or $-H - w = -3y$ or $\frac{H}{3} = y - \frac{w}{3}$		2	M1
			$y = \frac{H+w}{3}$		A1 oe e.g. $y = \frac{-H-w}{-3}$, $y = \frac{H}{3} + \frac{w}{3}$
					Total 8 marks

International GCSE Maths				
Apart from question 6d, 9b, 15, 18, 21c (where the mark scheme states otherwise) the correct answer, unless clearly obtained from an incorrect method, should be taken to imply a correct method.				
Q	Working	Answer	Mark	Notes
1 a		26 or 64	1	B1 or both 26 and 64 with no others
		21 or 39	1	B1 or both 21 and 39 with no others
		17 or 31	1	B1 or both 17 and 31 with no others
		1 or 64	1	B1 or both 1 and 64 with no others
				Total 4 marks
2 a		3000	1	B1
		6.5	1	B1
				Total 2 marks
3 a			2	M1 for at least 2 correct tallies or frequencies
		2, 5, 4, 3, 2		A1 mark frequencies only – in either column
	b	1	1	B1 allow ft from (a)
	c	4	1	B1
				Total 4 marks
4 a		New York	1	B1 accept –15
	b	25	1	B1 accept –25
	c	–28	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 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 $0.375 \div 6 \times 5$ Allow $0.375 \times 0.83 \dots$ oe		eg $\frac{3}{8} \times 48 = 18$ and 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 $\frac{3}{8} \times \frac{5}{6} = \frac{15}{48}$ $0.375 \times 0.83 \dots = 0.31 \dots$		"15" "48"		M1 For an attempt to multiply fractions or Dividing their 15 by their 48
			$\frac{5}{16}$		A1 dep on M1
	Total 3 marks				

International GCSE Maths				
Apart from question 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)		7534	1	B1
(b)	eg 3600 – 3574 or 3745 – 3600		2	M1 for 3600 – “number” or “number” – 3600 where “number” contains the digits 3,4,5,7. Must have attempted to evaluate this calculation
		26		A1 cao
				Total 3 marks
2 (a)		Pentagon	1	B1
(b)		acute angle clearly indicated with ‘A’	1	B1 allow either angle or both acute angles indicated
(c)		reflex angle clearly indicated with ‘R’	1	B1 accept either the interior reflex angle, or any of the exterior reflex angles, if labelled outside of the shape with an arc
				Total 3 marks
3 (a)		18	1	B1
(b)(i)	eg 66 – 15 – 9 – 3 – “18” or 66 – (7.5 × “6”) or 66 – 45		2	M1ft ft their 18 from part (a)
		21		A1ft ft their 18 from part (a) eg 66 – 15 – 9 – 3 – their answer to part (a)
(ii)		$3\frac{1}{2}$ diagrams drawn	1	B1ft follow through their 21 from (b)(i)
				Total 4 marks

International GCSE Maths				
Apart from Questions 17 and 22a 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)		5, 39, 71, 122, 150	1	B1
(b)		0.074, 0.13, 0.37, 0.7, 3.77	1	B1
(c)		5084	1	B1
(d)		3 hundreds	1	B1 accept 300, hundreds
				Total 4 marks
2 (a)		Bar drawn of height 44	1	B1
(b)		North America	1	B1
(c)		Asia	1	B1
(d)		68	1	B1
				Total 4 marks
3 (a)		57.6	1	B1
(b)		Arrow pointing at 240	1	B1
(c)		0.79	1	B1
				Total 3 marks
4 (a)		kite	1	B1
(b)(i)		Prism	1	B1 accept triangular prism
(ii)		9	1	B1
				Total 3 marks

2	(a)(i)		Isosceles	1	B1 allow incorrect spelling
	(ii)		Square	1	B1 allow incorrect spelling
	(b)		Correct line	1	B1
	(c)		4	1	B1 cao
Total 4 marks					
3	(a)		16	1	B1 cao
	(b)	19 and 10 or -9 or 19 - x or y - 10		2	M1 Allow 19 and 10 seen on pictogram x and y are incorrect values
		Correct answer scores full marks (unless from obvious incorrect working)	9		A1 SC B1 for 3 or 6 with or without seeing the figures on the pictogram
	(c)		Three large squares and one small square	1	B1 oe eg 13 small squares
Total 4 marks					
4	(a)		70	1	B1 cao
	(b)		15	1	B1 cao
	(c)		7000	1	B1 allow -40
					Total 3 marks

6	250 ÷ 14 (= 17.85....) or 17 or 18 or 14 + 14 + 14 (seventeen or eighteen times) oe		3	M1
	17 × 14 (= 238)			M1 This mark assumes previous M1
	Correct answer scores full marks (unless from obvious incorrect working)	12		A1
				Total 3 marks

7	$3.5 \text{ km} = 3500 \text{ m}$ or $950 \text{ m} = 0.95 \text{ km}$ or $1.8 \text{ km} = 1800 \text{ m}$ or $1200 \text{ m} = 1.2 \text{ km}$ or $8 \text{ km} = 8000 \text{ m}$		4	B1 for one correct conversion
	$3.5 + "0.95" + 1.8 + "1.2" (= 7.45)$ or $"3500" + 950 + "1800" + 1200 (= 7450)$			M1 can gain this mark for adding their converted figures even if incorrect but some attempt must have been made to convert 2 relevant values. (eg incorrect but $350 + 950 + 180 + 1200$)
	$8 - "7.45" (= 0.55)$ or $8000 - "7450"$			M1ft Correct compatible units ft their total dep on Marion's distance being less than Talha's
	Correct answer scores full marks (unless from obvious incorrect working)	550		A1
Total 4 marks				

Question	Working	Answer	Mark	Notes
8	a	y^3	1	B1
	b	$6cd$	1	B1
	c	k	1	B1 accept $1k$
9	a	Alto Campoo	1	B1 Do not accept -8
	b	8	1	B1
	c	$(-7) - 1800 \div 300$ -13	2	M1 for $\pm 1800 \div 300$ or ± 6 A1
10	a	$\frac{10}{20}$	1	B1 Accept $0.5, \frac{1}{2}, \frac{5}{10}, 50\%$
	b	$\frac{3}{20}$	1	B1 Accept $0.15, 15\%$
	c	$\frac{9}{20+1+2+2}$ or $\frac{7}{20}$ $\frac{9}{25} = 0.36$ and $\frac{7}{20} = 0.35$ Adam with reason	3	M1 for at least one probability M1 for both correct probabilities A1 Adam with 0.36 and 0.35 clearly seen oe

Question	Working					Answer	Mark	Notes
5 (a)		chocolate	strawberry	vanilla	TOTAL	Correct completed table	3	B3 fully correct table
	cones	16	40	22	78			B2 for 4 or 5 correct entries
	tubs	7	14	21	42			B1 for 2 or 3 correct entries
	TOTAL	23	54	43	120			
	(b)						$\frac{22}{120}$	2
						Total 5 marks		
6 (a)						1800	1	B1
						32 045	1	B1
						Correct statement	1	B1 e.g. Billy should have done 5×7 and added 2 to the answer to this.
						Correct sum	1	B1 e.g. 2 + 4= 6 (2 added to any even number)
						Total 4 marks		



Question	Working	Answer	Mark	Notes
3	(a)	9 squares shaded	1	B1
	(b)	$7\frac{2}{3}$	1	B1
	(c)	$60 \div 5$ or 12 or 2×60 or 120	2	M1 A1
	(d)	24 Correct conclusion based on correct figures	2	M1 or use of decimals for 0.25 and 0.125 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, 0.1666... 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

International GCSE Maths				
Apart from question 2d, 18b, 23 (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) (i)		129	1	B1
(a)(ii)		80	1	B1
(b)(i)		2457	1	B1
(b)(ii)		___ 4 or ___ 2	1	B1 4 cards arranged with the 4 or 2 at the end
			Total 4 marks	
2 (a)		Vietnam	1	B1
(b)		30	1	B1
(c)		Correct bar	1	B1
(d)	"43" – "3"		2	M1 (41 - 44) – (1 - 4)
		40		A1 dep on M1, ft answers in range given
			Total 5 marks	



Question	Working	Answer	Mark	Notes
1	(a)	-8, -5, 0, 1, 3	1	B1
	(b)	2.082, 2.28, 2.5, 2.805, 2.85	1	B1
	(c)	14	1	B1
	(i)			
	(ii)	19	1	B1
Total 4 marks				
2	(a)	Bar drawn to 12	1	B1
	(b)	Bogota, Lima	1	B1
	(c)	Manila	1	B1
	(d)	11	1	B1
	(e)	90 : 60 oe		M1 or for an answer of 2 : 3
		3 : 2	2	A1 cao
Total 6 marks				



6	$5 \times 25 (= 125)$		4	M1 total number of balloons
	'125' $\div$ 32 (= 3.9....)			M1
	'125' $- (32 \times 3)$ or $125 - 96$ or $3\frac{29}{32}$			M1
		29		A1
				Total 4 marks

Alternative Mark Scheme for Q6				
6	$5 \times 25 (= 125)$		4	M1
	$32 \times 3 (= 96)$ or $32 \times 4 (= 128)$			M1
	'125' $- (32 \times 3)$ or '125' $- 96$			M1
		29		A1
				Total 4 marks

7	$180^\circ - (104^\circ + 42^\circ) (= 34^\circ)$ or $\frac{180^\circ - '34^\circ'}{2}$		4	M1 for one correct stage
		73		A1 for 73
	- Angles in a triangle sum to 180° or (angles in a triangle sum to 180°) - Angle BDC and angle DBA are alternate angles - Base angles in an isosceles triangle are equal or (Allied / co-interior angles add up to 180°)	correct reasons		B2 dep fully correct method. for all correct reasons for the method used NB allied angles may not be needed if using ABD sum to 180° (B1 dep M1 for one correct reason)
				Total 4 marks

International GCSE Maths				
Apart from questions 15c, 17, 25 (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		Makalu	1	B1 Accept 8485
b		Five thousand eight hundred and ninety five	1	B1
c		800	1	B1 Accept 8 (eight) hundreds, hundreds, 100('s),
d		2077	1	B1 Accept -2077
				Total 4 marks

2 ai		likely	1	B1
aii		impossible	1	B1
b		cross at $\frac{1}{2}$	1	B1
c		cross at $\frac{1}{6}$	1	B1
				Total 4 marks

3 a		Trapezium	1	B1
b		42	1	B1 Accept 40 – 44
c		Correct lines marked	1	B1
d		2	1	B1
				Total 4 marks



Question	Working	Answer	Mark	Notes
3 (a)		Wednesday	1	B1 Accept Wed
(b)		55	1	B1
(c)		Correct Bars	1	B1 Susan 1.5 cm, Philip 4 cm (and having the correct key)
(d)	$\frac{25}{100} \times 180$ or 0.25×180 or $180 \div 4$ oe		2	M1
		45		A1
Total 5 marks				
4 (a)		Chicago	1	B1 Accept misspellings
(b)		16	1	B1 accept -16
(c)	$-1 + 2 \times 3$		2	M1 for clearly adding 3 lots of 2 or the sequence - 1, 1, 3, 5
		5		A1
Total 4 marks				
5 (a)	800×1.75		2	M1
		1400		A1
(b)	$60 - (98 \div 1.75)$ oe	$60 \times 1.75 - 98 (= 7)$ and $7 \div 1.75$	2	M1 accept $(98 \div 1.75) - 60$
		4		A1 accept - 4
Total 4 marks				

International GCSE Maths				
Apart from question 9c, 13, 21b 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)		Two thousand and fifty one	1	B1
(b)		1700	1	B1
(c)		1479	1	B1
(d)		1150	1	B1
				Total 4 marks

2 (a)		20	1	B1
(b)	32, "20", 18, 22		2	M1ft for at least 3 correct values or clear use of multiples of 8
		92		A1ft 72 + "answer to (a)"
(c)		3 and $\frac{1}{4}$ symbols	1	B1
				Total 4 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	e.g. $5950 \div 1000 (= 5.95)$ or $9000 \div 1000 (= 9)$ or $14.5 \times 1000 (= 14\,500)$ or $30 \times 1000 (= 30\,000)$ or $(5950 + 9000) \div 1000 (= 14.95)$		3	M1 for one correct conversion
	e.g. $"5.95" + 14.5 + "9" (= 29.45)$ or $"14.95" + 14.5 (= 29.45)$ or $5950 + "14\,500" + 9000 (= 29\,450)$ or $30\,000 - (5950 + "14\,500" + 9000) = 550$ or $30 - ("5.95" + 14.5 + "9") = 0.55(0)$			M1 for a complete method for adding with their adjusted figures
		Shown with correct figures		A1 e.g. Shown with 29.45 Shown with 29 450 Shown 550 Shown 0.55(0)
Total 3 marks				
6	(a)(i)	5,6	1	B1 oe e.g. $\frac{28}{5}, 5\frac{3}{5}$
	(ii)	2744	1	B1 Allow 2,744
	(b)(i)	3	1	B1
	(ii)	7	1	B1
Total 4 marks				



International GCSE Maths				
Apart from Questions 8, 12a, 12b, 15, 17 and 18 (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)		Hamlet	1	B1
(b)		Henry V and Julius Caesar	1	B1
(c)		26 450	1	B1
(d)		Twenty one thousand and fifty five	1	B1
				Total 4 marks

International GCSE Maths A January 2023– Paper 2F Mark scheme				
Apart from Questions 16, 17, 19, 20c, 22 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)		3567	1	B1
(b)		7536	1	B1
(c)		37 or 53 or 73 or 67	1	B1
(d)		56	1	B1
			Total 4 marks	
2 (a)		USA	1	B1
(b)		Pictogram completed with 1 and a half symbols	1	B1
(c)	$11 + 7$ or eg $(2.75 + 1.75) \times 4$		2	M1 For two numbers added together, one of which is correct
	Correct answer scores full marks (unless from obvious incorrect working)	18		A1
			Total 4 marks	



International GCSE Maths				
Apart from Questions 13, 14d, 15, 25 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)		84, 105, 171, 233, 490	1	B1
(b)		5102	1	B1
(c)		3 tens	1	B1 accept 30, tens
(d)		700	1	B1
				Total 4 marks
2 (a)		40	1	B1
(b)		USA	1	B1
(c)		95	1	B1
(d)		Bar drawn height 25	1	B1
				Total 4 marks
3 (a)		Octagon	1	B1
(b)		Acute	1	B1
(c)		Chord drawn	1	B1
(d)		360	1	B1
				Total 4 marks

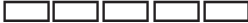


15	(a)		Valid Reason	1	B1 eg Finn added 5 and 3, but he should have squared the 3 first.
	(b)		$2 \times 6 - (4^2 - 14)$	1	B1 Brackets in correct location. Condone correct but unnecessary brackets. [must not be around the minus sign between the 6 and the 4^2]
	(c)	9 + ... or + 10 or $(-3)^2 + 5 \times 2$ or $-3 \times -3 + 5 \times 2$		2	M1 For either 9 or 10 in the correct place or the correct substitutions (brackets around -3 squared, unless recovered)
		Correct answer scores full marks (unless from obvious incorrect working)	19		A1
					Total 4 marks

International GCSE Maths				
Apart from questions 15, 20a, 22 (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)		Twenty eight thousand one hundred (and) forty nine	1	B1 All must be in words – accept incorrect spelling if meaning is clear. Sometimes ‘and’ may be included in places it is not included here – please allow this. Allow words such as ‘fourty’ or ‘thority’ or ‘fourlity’ for forty and similar words for other numbers
(b)		Kenya	1	B1 accept incorrect spelling if meaning is clear. Allow K or k or other shortened form of Kenya
(c)		80	1	B1 Eighty or tens or 8 tens or 8×10 s or similar. (Not 8 tenths) accept incorrect spelling if meaning is clear.
(d)		16 000	1	B1 accept ‘16 thousand’ or ‘sixteen thousand’
				Total 4 marks



3	(a)		267	1	B1	cao
	(b)		2744	1	B1	cao
	(c)	eg selecting 987 and 139 or for $987 - n$ where n is a number from the list or $m - 139$ where m is a number from the list or for 987, 973, 393, 151, 139 or for 139, 151, 393, 973, 987		2	M1	for identifying 987 and 139, could be shown or circled or for $987 - n$ where n is a number from the list or $m - 139$ where m is a number from the list or for writing the numbers in order of size
		Correct answer scores full marks (unless from obvious incorrect working)	848		A1	cao
Total 4 marks						

4	(a)		28	1	B1	cao
	(b)		1 symbol and one small square from the symbol shown	1	B1	oe eg 5 small squares from the symbol 
	(c)		20	1	B1	cao
Total 3 marks						

5	(a)		-14, -8, -3, 12, 24	1	B1	
	(b)		20	1	B1	
	(c)		-16	1	B1	
	(d)		11	1	B1	
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)		725	1	B1 cao
(b)		32	1	B1 cao
(c) (i)		4578	1	B1 cao
(ii)		8754	1	B1 cao
				Total 4 marks

2 (a)		24	1	B1 cao
(b)	"24" + 32 + 42 + 28 or $15 \times 8 + 4 + 2$ oe		2	M1 fit their "24", allow one error or omission in adding values
		126		A1 cao
(c)		2 and $\frac{3}{4}$ circles	1	B1 oe eg 2 and $\frac{1}{2}$ and $\frac{1}{4}$ circles
				Total 4 marks

3 (a)		6	1	B1 cao
(b)		8	1	B1 cao
(c)		diameter	1	B1 accept chord, condone incorrect spelling
(d)		tangent	1	B1 condone incorrect spelling
				Total 4 marks

4 (a)		20e	1	B1 allow e20
(b)		15	1	B1 cao
				Total 2 marks



International GCSE Maths				
Apart from questions 15, 17b, 20, 24 (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		8632	1	B1 cao
b		24	1	B1 cao
c		17	1	B1 cao
				Total 3 marks

2 a	5 – 9			M1
		–4	2	A1
bi		4	1	B1
bii	–7, –6, –5, –1, 0, 4, 4			M1 for writing the values in the correct order, condone one error or omission or for an answer of 0
		–1	2	A1
				Total 5 marks

3 a		Kite drawn	1	B1
b		Octagon	1	B1
ci		Cuboid	1	B1
cii		8	1	B1
				Total 4 marks



International GCSE Maths A January 2020 – Paper 2FR Mark scheme				
Apart from Questions 12d and 21, 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)		70 216	1	B1 cao
(b)		1, 2, 5 or 10	1	B1 Any of these values with no other incorrect value
(c)		25 or 36	1	B1 One or both of 25 or 36 and no other incorrect value
(d)		15	1	B1
(e)		$42 - 6 \div (6 - 3)$	1	B1 Allow $42 - (6 \div (6 - 3))$
				Total 5 marks
2 (a)		Frequencies and tallies of 2, 3, 8, 4, 5, 2	2	B2 All frequencies and tallies correct B1 for 3, 4 or 5 frequencies or tallies correct NB. Frequencies and tallies must be in the correct column. Accept 2/24 etc. in frequency column
(b)		3	1	B1ft Follow through from table
(c)		Sensible statement	1	B1 Not enough 1's or 6's Too many 3's Rolled a 3 a third of the times Should expect to get 4 of each number
				Total 4 marks
3 (a)		An acute angle drawn at A	1	B1
(b)		Diameter drawn	1	B1 Diameter should not extend significantly beyond circumference.
				Total 2 marks



International GCSE Maths				
Apart from question 22c (where the mark scheme states otherwise) the correct answer, unless clearly obtained from an incorrect method, should be taken to imply a correct method.				
Q	Working	Answer	Mark	Notes
1 (a)		8	1	B1 cao allow words
(b)		35	1	B1 cao allow words
(c)		17	1	B1 cao allow words
(d)		9	1	B1 cao allow words
(e)		17 & 48	1	B1 cao either order
				Total 5 marks
2 (a)		12.6	1	B1 Allow 12.6(000...) may be seen under the arrow
(b)		1.4	1	B1 Allow 1.4(000...) may be seen by the scales
(c)		760	1	B1 Allow 760(.000...)
(d)		91.6	1	B1 Allow 91.6(00)
(e)		19 15	1	B1 Allow 19.15 or 19:15 oe
				Total 5 marks

international GCSE Maths				
Apart from Question 17 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)		7054	1	B1
(b)		78 300	1	B1
(c)		70 000	1	B1 or seventy thousand oe or tens of thousands or 10 000 (the place value of the 7)
(d)		2000	1	B1 2,000 accept 2000 seen elsewhere if box is empty
(e)		10 000	1	B1 10^4
				Total 5 marks
2 (a)		60	1	B1
(b)		9	1	B1
(c)		21	1	B1 Sometimes continental 1 looks like 7...please accept as no 27 on list
(d)		15	1	B1
				Total 4 marks



International GCSE Maths				
Apart from questions 11, 13, 16b and 24 (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)(i)	40	1	B1 cao
	(ii)	27	1	B1 allow 3^3
	(b)	-9	1	B1 cao
	(c)	21	1	B1 cao
	(d)	2 + odd prime number	1	B1 eg. 2 + 3, 2 + 5 etc
				Total 5 marks
2	(a)	Canada	1	B1
	(b)	420	1	B1 cao
	(c)	90	1	B1 cao
	(d)	Correct bar chart	1	B1 Allow $\pm$ half square tolerance for height of bar
				Total 4 marks
3	(a)	reflex	1	B1
	(b)	radius	1	B1
	(c)	pentagon	1	B1
	(d)	9	1	B1 cao
				Total 4 marks

International GCSE Maths				
All figures in inverted commas must come from a correct method previously seen unless otherwise stated.				
Q	Working	Answer	Mark	Notes
1 (a)		7800	1	B1
(b)(i)		10 000	1	B1 10000, 10,000 in the box
(b)(ii)		1000	1	B1 1,000 in the box could be in the area around the box
(c)		Any four from 1, 2, 3, 6, 9, 18	1	B1 Can be 4 or more than 4 but all must be in this list If only 4 values there cannot be a repeated value
(d)		17	1	B1 Could be clearly shown in list – eg circled or underlined with no other number indicated
				Total 5 marks

11	(a)(i)		<	1	B1 for <
	(ii)		>	1	B1 for >
	(b)		Neon	1	B1 for neon
	(c)		Mercury	1	B1 for mercury
	(d)	$(-35 - -101) \div 10 (= \pm 6.6)$ or $\pm 66 \div 10 (= \pm 6.6)$ or $(-35 - -101) \div 5$ or $\pm 66 \div 5$ or clearly showing counting down from -35 to -95 in 10's or 5's and indicating times by the side or from 35 to 95 in 10's or 5's and indicating times by the side with at most one error or $-95 = 12$ mins or $-100 = 13$ mins or $-105 = 14$ mins or a correct method to get 66 and one of $60 = 12$ mins or $65 = 13$ mins or $70 = 14$ mins or a correct method to get 66 and clearly showing counting up or down in 10's or 5's or an answer of 13 or 14 or 13.12		2	M1
			13.2		A1 for 13.2 or 13 minutes 12 seconds
					Total 6 marks

International GCSE Maths				
Apart from Q13, 20 & 21 (where the mark scheme states otherwise) the correct answer, unless obtained from an incorrect method, should be taken to imply a correct method.				
Q	Working	Answer	Mark	Notes
1 (a)		12 348	1	B1
(b)		84 312	1	B1
(c)		1,3	2	B2 for both correct values -1 eeo
(d)		2,3	2	B2 for both correct values -1 eeo
				Total 6 marks
2 (a)		Wednesday	1	B1
(b)	4 : 2.5 or 16 : 10 oe		2	M1
		8 : 5	A1	M1 A0 for 5 : 8
(c)		3.5 “envelopes”	1	B1 Accept for half an envelope 
(d)	$\frac{6}{14}$		2	M1
		$\frac{3}{7}$	A1	
(e)	eg Heights of bars (cms): 7, 5.5, 3 or heights of 3.5, 2.75, 1.5 cms	bars at correct heights and correct scale	2	B2 B2 for all bars at correct heights with a correct scale (at least one value, not contradicted. 0 implied) If not B2 then B1 for 1 error on heights or no scale, but with heights in correct proportion eg 7, 5.5, 3 cms
				Total 8 marks

3	(a)		-89, -77, -6, 39, 43	1	B1
	(b)		0.017, 0.12, 0.134, 0.145, 0.3	1	B1 Allow extra zeros eg 0.017, 0.120, 0.134, 0.145, 0.300
	(c)		70	1	B1
	(d)		0.27	1	B1
	(e)	$1 - \frac{7}{10} (= \frac{3}{10} = 0.3 = 30\%)$ or $\frac{7}{10} \times 60 (= 42)$ oe		2	M1
		<i>Correct answer scores full marks (unless from obvious incorrect working)</i>	18		A1
					Total 6 marks

Apart from Questions 13(b) and 13(c) (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)		36, 73, 89, 138, 219	1	B1
		2018	1	B1
		Four thousand three hundred and nine	1	B1
		700	1	B1 oe eg 100
		290	1	B1
		$\frac{4}{5} \times 185$ or 0.8×185 oe	2	M1 A1 For a complete method
2 (a)		3	1	B1
		4	1	B1
		12	1	B1 for 12 or ft from (i) for “4” $\times$ 3
		18	1	B1 for 18 or ft from (i) for “4” $\times$ 4.5

5	(a)	4 – – 6 or – 6 – 4 or – 10		2	M1 Identifying 4 and – 6 only. or for stating 10 or – 10
			10		A1
	(b)	– 6, – 5, – 1, 3, 4 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		$\frac{4}{15} \times 1200 (= 320)$ or for $\frac{3}{15}$ or $\frac{8}{15}$ seen		4	M1
		1200 – “320” (= 880) and “880” ÷ 11 (= 80) or $\frac{3}{11} \times 880 (= 240)$ oe or $\frac{3}{15} \times 1200 (= 240)$ oe			M1
		1200 – (“320” + “240”) or 880 – 240 (= 640) or $\frac{8}{11} \times 880 (= 640)$ 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

13	$0.32 \times 450 (= 144)$ oe or $\frac{2}{5} \times 375 (= 150)$ oe		3	M1
	$0.32 \times 450 (= 144)$ 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 OR for at least 3 multiples of both 20 and 35 e.g. 20, 40, 60, ... and 35, 70, 105, ...		2	M1
		140		A1 allow $2 \times 2 \times 5 \times 7$ oe
				Total 2 marks

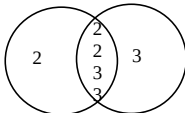
15	$\pi \times 15^2 (= 225\pi)$		2	M1
		707		A1 awrt 707
				Total 2 marks

16	(a)	47	1	B1 Answer in range 46.5 – 47.5
	(b)		2	M1
	A correct method to convert either dirham to euros or euros to dirham e.g. 400 Dirham = 2×200 Dirham = $2 \times "47"$ (= 94) euros or 90 euros = $30 + 60 = 127.5 + 255 = 382.5$ Dirham			
		France with correct calculations		A1
				Total 3 marks

22		$8^2 + 15^2 (= 289)$	167	5	M1
		$\sqrt{8^2 + 15^2} (= 17)$		M1	
		$\pi \times 8.5^{n2} (226.98\dots)$ or $0.5 \times 15 \times 8 (= 60)$		M1	
		$\pi \times 8.5^{n2} - 0.5 \times 15 \times 8$ (“226.98” – “60”)		M1	
				A1 Accept answers which round to 167	
					Total 5 marks
23			$2^4 \times 3^2 \times 5^4 \times 11 \times 13$	2	B2 (B1 for 12 870 000 or correct unsimplified product or $2^m \times 3^n \times 5^p \times 11 \times 13$ with at least 1 of m, n or p correct or for $2^4 \times 3^2 \times 5^4$)
					Total 2 marks

21		$5^3 \times 7^2 \times 11^4$	2	B2 Accept $5^3, 7^2, 11^4$ allow 89 676 125 with $5^3 \times 7^2 \times 11^4$ seen If not B2 then award B1 for $5^p \times 7^q \times 11^r$ with two of $p = 3, q = 2$ and $r = 4$ (or omission of one with others fully correct) or for 89 676 125 without $5^3 \times 7^2 \times 11^4$ seen or for $5 \times 5 \times 5 \times 7 \times 7 \times 11 \times 11 \times 11 \times 11$ or for an answer of $5^3 + 7^2 + 11^4$ or $5^3, 7^2, 11^4$
				Total 2 marks

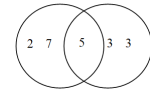


18	1, 2, 3, 4, 6, 8, 9, 12, 18, 24, 36, 72 and 1, 2, 3, 4, 6, 9, 12, 18, 27, 36, 54, 108 or 2 2 2 3 3 and 2 2 3 3 3 or <table data-bbox="579 934 753 1008"><tr><td>12</td><td>72</td><td>108</td></tr><tr><td>3</td><td>6</td><td>9</td></tr><tr><td></td><td>2</td><td>3</td></tr></table>	12	72	108	3	6	9		2	3		2	M1 for any correct valid method and no errors eg for starting to list at least four different factors of each number and no errors or 2 2 2 3 3 and 2 2 3 3 3 seen or 4 2 3 3 and 4 3 3 3 seen or 2 2 2 9 and 2 2 3 9 seen or 4 2 9 and 4 3 9 seen or 2 36 and 3 36 etc (may be in a factor tree or a ladder diagram with no errors and ignore 1) or a fully correct Venn diagram or other clear method, eg table
12	72	108											
3	6	9											
	2	3											
	Working required	36		A1 dep on M1 Accept $2^2 \times 3^2$ oe									
				Total 2 marks									

23	B1 for $2^2 \times 5^2$ oe or $2 \times 2 \times 5 \times 5$ oe or $2^2 \times 7$ oe or $2 \times 2 \times 7$ oe or $5^2 \times 7$ oe or $5 \times 5 \times 7$ oe or $2^2 \times 5 \times 7$ oe or $2 \times 2 \times 5 \times 7$ oe or $2 \times 5^2 \times 7$ oe or $2 \times 5 \times 5 \times 7$ oe or $2^2 \times 5^2 \times 7 \times 11$ or $2 \times 2 \times 5 \times 5 \times 7 \times 11$ oe or 700 or $2^p \times 5^q \times 7^r$ where two of p or q or r are correct	$2^2 \times 5^2 \times 7$	2	B2 Allow $2 \times 2 \times 5 \times 5 \times 7$ Answers must be a product of prime factors Can be in any order (allow $2^2 \cdot 5^2 \cdot 7$) Do not allow 1 in the final answer $2 \times 2 \times 5 \times 5 \times 7$ in working space and 700 on answer line award B2 $2^2 \times 5^2 \times 7$ in working space and 700 on answer line award B2 (B1 for $2^p \times 5^q \times 7^r$ where two of p or q or r are correct or one mistake in their product (see working on the left for examples) or for 700)
Total 2 marks				



15	eg $119 \div 140 (\times 100)$ or $0.85 (\times 100)$ or $\frac{17}{20} (\times 100)$ oe		2	M1
	<i>Correct answer scores full marks (unless from obvious incorrect working)</i>	85		A1
				Total 2 marks

16	45, 90, 135, 180... and 70, 140, 210, 280... or 2, 5, 7 and 3,3,5 or  or $\frac{45 \times 70}{5}$ or 2, 3, 3, 5, 7 oe or <table border="1"><tr><td>5</td><td>45</td><td>70</td></tr><tr><td></td><td>9</td><td>14</td></tr></table> or 5, 9, 14 oe	5	45	70		9	14		2	M1 for any correct valid method eg for starting to list at least four multiples of each number or 2, 5, 7 and 3, 3, 5 seen (may be in a factor tree, ignore 1) or a fully correct Venn diagram or 5, 9, 14 oe (could be in a table)
5	45	70								
	9	14								
	Correct answer scores full marks (unless from obvious incorrect working)	630		A1 Allow $2 \times 3^2 \times 5 \times 7$ oe eg $5 \times 9 \times 14$						
				Total 2 marks						

17		142.75	1	B1
		142.85	1	B1 accept 142.8499... or 142.849
				Total 2 marks

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
4 (a)		(2, -1)	1	B1
(b)		3.6	1	B1 Allow 3.4 to 3.8 and answers written as fractions in this range eg $3\frac{1}{2}$
(c)		D marked at (-1, -1)	1	B1
Total 3 marks				
5 (a)		24	1	B1 Accept 32 or 40 or 48
(b)		2	1	B1
(c)		No It is divisible by 3	1	B1 Only consider reason if No is given. Allow any reason that shows a clear understanding of why 57 is not prime, eg it is divisible by 19 or 3 or equal to 3×19 .
Total 3 marks				
6 (a)		correct pattern	1	B1 5 dots $\times$ 5 dots open square
(b)		16, 20	1	B1
(c)	eg 4×13 or $14 + 14 + 12 + 12$ or $12 \times 4 + 4$ or 24, 28, 32, 36, 40, 44, 48, 52 or a fully correct diagram		2	M1 allow 1 arithmetical error in continuing the sequence to 13 terms
(d)		52 $4n$	1	A1 B1 oe eg $n + n + n + n$ or $4 + (n - 1)4$
(e)	$90 \div 4$ (= 22.5) or 88		2	M1 or continuing the sequence to 88 or 92 with just one error
		22		A1
Total 7 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	
5	(i)		81	1	B1	
	(ii)		10	1	B1	
	(v)		23	1	B1	
						Total 3 marks
6	(a)	$\frac{40.194}{8.76}$	4.5883(56164)	2	M1 A1	40.194 or 8.76 seen or implied by 4.588 At least 4 digits reqd after decimal point.
	(b)		4.6	1	B1ft	For 4.6 or ft from (a) if at least 3 s.f.
						Total 3 marks
7	(a)		(2, 3)	1	B1	
	(b)		D	1	B1	
	(c)	$(-2 + 4) \div 2$ or $(3 + 1) \div 2$	(1, 2)	2	M1 A1	
						Total 4 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 SCB1 for 60 × 80 (=4800)
Total 3 marks				

23	(a)		2×3^{37}	1	B1
	(b)	$2 \times 3^{43} \times 2^4 \times 3^{37}$ or $2^5 \times 3^p$ ($p \neq 80$) or $2^q \times 3^{80}$ ($q \neq 5$)		2	M1
			$2^5 \times 3^{80}$		A1
					Total 3 marks

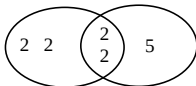


11	0.23 × 450 oe		2	M1 or for an answer of 553.5 or 346.5
		103.5		A1
				Total 2 marks

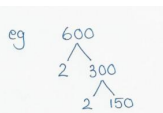
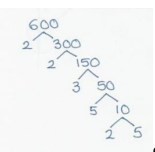
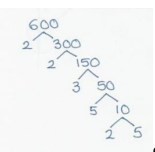
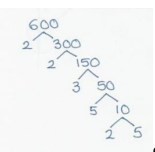
12	a		1, 3, 9	1	B1 need all three but ignore any repeats															
	b	15, 30, 45, 60, 75, 90, 105, 120, 135, 150, 165, 180, 195, 210 and 70, 140, 210 OR 3 × 5 and 2 × 5 × 7 OR 2 × 3 × 5 × 7 (2, 3, 5, 7) oe eg 3 × 5 × 14 (3, 5, 14)		2	M1 for listing at least three multiples of 15 and 70 or finding 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)															
		<table><tr><td>3</td><td>15</td><td>70</td></tr><tr><td>5</td><td>5</td><td>70</td></tr><tr><td>7</td><td>1</td><td>14</td></tr><tr><td>2</td><td>1</td><td>2</td></tr><tr><td></td><td>1</td><td>1</td></tr></table>	3	15	70	5	5	70	7	1	14	2	1	2		1	1			
3	15	70																		
5	5	70																		
7	1	14																		
2	1	2																		
	1	1																		
			210		A1															
					Total 3 marks															

14	(a)	Spinner B					Correct values	2	B2 (B1 for all 9 correct values 5 or 6 or 7 or 8 correct values)
			1	2	3	4			
		1	(2)	(3)	4	5			
		2	(3)	4	5	6			
		3	4	5	6	7			
	(b)							2	M1 for $\frac{6}{m}$ where $m > 6$ or $\frac{n}{12}$ where $n < 12$
							$\frac{6}{12}$		A1ft $\frac{"6"}{12}$ oe ft their table. isw incorrect cancelling.
	(c)	'3' 12	×84					2	M1 allow “a fraction” × 84 fraction cannot be zero or improper
							21		A1 cao
Total 6 marks									

15			3	M1 for continual prime factorisation (at least two consecutive steps correct) or at least two stages of a factor tree, or table, correct.
				M1 for a fully correct factor tree or a list (2,2,2,2,5,11) or $2 \times 2 \times 2 \times 2 \times 5 \times 11$
		$2^4 \times 5 \times 11$		A1 dep M2 for $2^4 \times 5 \times 11$ (with working seen)
Total 3 marks				

13	16, 32, 48,... and 20, 40, 60... or [9] 16, [9] 32, [9] 48, ... and [9] 20, [9] 40, [9] 60 (or 10), ... or 2, 2, 2, 2 or 2, 2, 5 or 		3	M1 for any correct valid method e.g. for starting to list at least three multiples of each number (allow one error (ft eg 16, 34, 50) in one list) or 2, 2, 2, 2 or 2, 2, 5 seen (may be in a factor tree and ignore 1) or for a Venn diagram with correct factors for one of 16 or 20
	16, 32, 48, 64, 80 and 20, 40, 60, 80 or [9] 16, [9] 32, [9] 48, [10] 04, [10] 20 and [9] 20, [9] 40, [9] 60 (or 10), [10] 20 or $2 \times 2 \times 2 \times 2 \times 5 (= 80)$ or $2^4 \times 5 (= 80)$			M1 for a correct method leading to 80 or the correct time (all working must be correct for the award of this mark) or for stating 80
	<i>Working not required, so correct answer scores full marks (unless from obvious incorrect working)</i>	10 20		A1 10 20 or 10 20 am or twenty past ten oe
				Total 3 marks



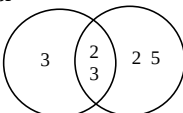
Question	Working	Answer	Mark	Notes																																							
15	eg $2 \times 2 \times 150$ or $2^2 \times 150$ $3 \times 5 \times 40$ or $2 \times 3 \times 100$ or $5 \times 5 \times 24$ or $5^2 \times 24$ eg  eg <table><tr><td>2</td><td>600</td></tr><tr><td>2</td><td>300</td></tr><tr><td></td><td>150</td></tr></table> <tr><td></td><td></td><td></td><td>3</td><td>M1 for at least 2 correct stages in prime factorisation which give 2 prime factors – may be in a factor tree or a table or listed eg 2, 2, 150 (see LHS for examples of the amount of work needed for the award of this mark, allow no more than one mistake ft (eg one mistake with 2 prime factors ft: $600 = 200 \times 30 = 2 \times 100 \times 5 \times 6$)</td></tr> <tr><td></td><td> eg $2 \times 2 \times 2 \times 3 \times 5 \times 5$  oe <table><tr><td>2</td><td>600</td></tr><tr><td>2</td><td>300</td></tr><tr><td>2</td><td>150</td></tr><tr><td>3</td><td>75</td></tr><tr><td>5</td><td>25</td></tr><tr><td>5</td><td>5</td></tr><tr><td></td><td>[1]</td></tr></table> oe <tr><td></td><td></td><td></td><td></td><td>M1 for 2, 2, 2, 3, 5, 5 (ignore 1s) (may be a fully correct factor tree or ladder)</td></tr><tr><td></td><td>Working required. NB: answer must be given as a product of powers of prime factors</td><td>$2^3 \times 3 \times 5^2$</td><td></td><td>A1 dep on M2 can be any order (allow $2^3 \cdot 3 \cdot 5^2$)</td></tr><tr><td></td><td></td><td></td><td></td><td>Total 3 marks</td></tr></td></tr>	2	600	2	300		150				3	M1 for at least 2 correct stages in prime factorisation which give 2 prime factors – may be in a factor tree or a table or listed eg 2, 2, 150 (see LHS for examples of the amount of work needed for the award of this mark, allow no more than one mistake ft (eg one mistake with 2 prime factors ft: $600 = 200 \times 30 = 2 \times 100 \times 5 \times 6$)		eg $2 \times 2 \times 2 \times 3 \times 5 \times 5$  oe <table><tr><td>2</td><td>600</td></tr><tr><td>2</td><td>300</td></tr><tr><td>2</td><td>150</td></tr><tr><td>3</td><td>75</td></tr><tr><td>5</td><td>25</td></tr><tr><td>5</td><td>5</td></tr><tr><td></td><td>[1]</td></tr></table> oe <tr><td></td><td></td><td></td><td></td><td>M1 for 2, 2, 2, 3, 5, 5 (ignore 1s) (may be a fully correct factor tree or ladder)</td></tr> <tr><td></td><td>Working required. NB: answer must be given as a product of powers of prime factors</td><td>$2^3 \times 3 \times 5^2$</td><td></td><td>A1 dep on M2 can be any order (allow $2^3 \cdot 3 \cdot 5^2$)</td></tr> <tr><td></td><td></td><td></td><td></td><td>Total 3 marks</td></tr>	2	600	2	300	2	150	3	75	5	25	5	5		[1]					M1 for 2, 2, 2, 3, 5, 5 (ignore 1s) (may be a fully correct factor tree or ladder)		Working required. NB: answer must be given as a product of powers of prime factors	$2^3 \times 3 \times 5^2$		A1 dep on M2 can be any order (allow $2^3 \cdot 3 \cdot 5^2$)					Total 3 marks
2	600																																										
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	150																																										
			3	M1 for at least 2 correct stages in prime factorisation which give 2 prime factors – may be in a factor tree or a table or listed eg 2, 2, 150 (see LHS for examples of the amount of work needed for the award of this mark, allow no more than one mistake ft (eg one mistake with 2 prime factors ft: $600 = 200 \times 30 = 2 \times 100 \times 5 \times 6$)																																							
	eg $2 \times 2 \times 2 \times 3 \times 5 \times 5$  oe <table><tr><td>2</td><td>600</td></tr><tr><td>2</td><td>300</td></tr><tr><td>2</td><td>150</td></tr><tr><td>3</td><td>75</td></tr><tr><td>5</td><td>25</td></tr><tr><td>5</td><td>5</td></tr><tr><td></td><td>[1]</td></tr></table> oe <tr><td></td><td></td><td></td><td></td><td>M1 for 2, 2, 2, 3, 5, 5 (ignore 1s) (may be a fully correct factor tree or ladder)</td></tr> <tr><td></td><td>Working required. NB: answer must be given as a product of powers of prime factors</td><td>$2^3 \times 3 \times 5^2$</td><td></td><td>A1 dep on M2 can be any order (allow $2^3 \cdot 3 \cdot 5^2$)</td></tr> <tr><td></td><td></td><td></td><td></td><td>Total 3 marks</td></tr>	2	600	2	300	2	150	3	75	5	25	5	5		[1]					M1 for 2, 2, 2, 3, 5, 5 (ignore 1s) (may be a fully correct factor tree or ladder)		Working required. NB: answer must be given as a product of powers of prime factors	$2^3 \times 3 \times 5^2$		A1 dep on M2 can be any order (allow $2^3 \cdot 3 \cdot 5^2$)					Total 3 marks													
2	600																																										
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5	25																																										
5	5																																										
	[1]																																										
				M1 for 2, 2, 2, 3, 5, 5 (ignore 1s) (may be a fully correct factor tree or ladder)																																							
	Working required. NB: answer must be given as a product of powers of prime factors	$2^3 \times 3 \times 5^2$		A1 dep on M2 can be any order (allow $2^3 \cdot 3 \cdot 5^2$)																																							
				Total 3 marks																																							

19	E.g. $2 \times 2 \times 900$ or $2^2 \times 900$ or $2 \times 3 \times 600$ or $2 \times 5 \times 360$ or $3 \times 3 \times 400$ or $3^2 \times 400$ or $3 \times 5 \times 240$ or $5 \times 5 \times 144$ or $5^2 \times 144$ E.g. <table><tr><td>2</td><td>3600</td></tr><tr><td>2</td><td>1800</td></tr><tr><td></td><td>900</td></tr></table> E.g. <pre> 3600 / \ 2 1800 / \ 2 900</pre>	2	3600	2	1800		900	3	M1 for at least 2 correct stages in prime factorisation which give 2 prime factors – may be in a factor tree or a table or listed eg 2, 2, 900 (see LHS for examples of the amount of work needed for the award of this mark, allow no more than one mistake ft in factor tree or table (eg one mistake with 2 prime factors ft: $3600 = 1800 \times 20 = 2 \times 900 \times 4 \times 5$ or $360 = 2 \times 2 \times 90$)												
2	3600																				
2	1800																				
	900																				
	E.g. $2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 5 \times 5$ E.g. <table><tr><td>2</td><td>3600</td></tr><tr><td>2</td><td>1800</td></tr><tr><td>2</td><td>900</td></tr><tr><td>2</td><td>450</td></tr><tr><td>3</td><td>225</td></tr><tr><td>3</td><td>75</td></tr><tr><td>5</td><td>25</td></tr><tr><td>5</td><td>5</td></tr><tr><td></td><td>(1)</td></tr></table> E.g. <pre> 3600 / \ 2 1800 / \ 2 900 / \ 2 450 / \ 2 225 / \ 3 75 / \ 3 25 / \ 5 5</pre>	2	3600	2	1800	2	900	2	450	3	225	3	75	5	25	5	5		(1)		M1 for 2, 2, 2, 2, 3, 3, 5, 5 or $2^4, 3^2, 5^2$ or $2^4 + 3^2 + 5^2$ (ignore 1s) (may be a fully correct factor tree or ladder)
2	3600																				
2	1800																				
2	900																				
2	450																				
3	225																				
3	75																				
5	25																				
5	5																				
	(1)																				
	Working required	$2^4 \times 3^2 \times 5^2$	A1 dep on M2 can be any order (allow $2^4 \cdot 3^2 \cdot 5^2$) (SCB1 for $3.6 \times 2^3 \times 5^3$)																		
			Total 3 marks																		

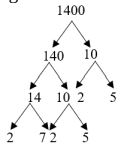
13	40, 80, 120, 160, 200, 240 48, 96, 144, 192, 240 or 40, 1h 20, 2h, 2h 40, 3h 20, 4h 48, 1h 36, 2h 24, 3h 12, 4h or 6 40, 7 20, 8 00, 8 40, 9 20, 10 00 6 48, 7 36, 8 24, 9 12, 10 00 or [(40 =) 8×5 and (48 =) 8×6 oe eg 40 = $2 \times 2 \times 2 \times 5$ and 48 = $2 \times 2 \times 2 \times 3$ (could be numbers on ends of factor trees)]		3	M1 for listing multiples of 40 and 48 with at least 3 numbers in each list. (Multiples could be given in minutes or in hours and minutes) Or for listing times after 6 am for both trains, with at least 2 times in each list (allow one ft error)[mark until you have seen 2 correct times with only one ft error]
	(LCM =) 8×30 (= 240) or 4 or 10 (am) shown in lists but not given as answer			A1 for 240 (minutes) or 4 (hours)
	<i>Correct answer scores full marks (unless from obvious incorrect working)</i>	10 00 (am)		A1 oe
				Total 3 marks

22	$2^2 \times 7$ or $2 \times 3 \times 7$ or $3^2 \times 7$ oe or showing at least 5 correct multiples across at least 2 lists (excluding 28, 42, 63) (28) 56, 84, 112, 140, 168, 196, 224, 252 (42) 84, 126, 168, 210, 252 (63) 126, 189, 252						3	M1 accept prime factors seen in factor tree or correct position in Venn diagram for at least one of the numbers given with no other numbers for that number incorrectly placed
	$2^2 \times 7$ and $2 \times 3 \times 7$ and $3^2 \times 7$ or showing at least 9 correct multiples across all 3 lists (excluding 28, 42, 63) (28) 56, 84, 112, 140, 168, 196, 224, 252 (42) 84, 126, 168, 210, 252 (63) 126, 189, 252							M1 accept prime factors seen in factor tree or correct position in Venn diagram for all 3 of the numbers given with no other numbers incorrectly placed
						252		A1 or $2^2 \times 3^2 \times 7$ Dep on M1
22 alt	7	28	42	63			3	M1 For one correct row in table eg division by 7 gives 4, 6, 9
	2	4	6	9				M1 Fully correct table – need only go as far as top table – we want to see prime factors along the side or prime factors along the sides and bottom (condone 1's)
	3	2	3	9				
		2	1	3				
	7	28	42	63				
	2	4	6	9				
	3	2	3	9				
	2	2	1	3				
	3	1	1	3				
	(1)	1	1	1				
						252		A1 or $2^2 \times 3^2 \times 7$ Dep on M1
							Total 3 marks	

19	eg $2 \times 2 \times 300$ $2 \times 5 \times 120$ $2 \times 3 \times 200$ $3 \times 5 \times 80$ or eg 1200 2 600 3 200 or <table><tr><td>2</td><td>1200</td></tr><tr><td>3</td><td>600</td></tr><tr><td></td><td>200</td></tr></table>	2	1200	3	600		200		3	M1 for at least 2 correct stages in prime factorisation which give 2 prime factors – may be in a factor tree or a table or listed eg 2, 2, 300 (allow no more than one mistake ft (eg <i>one mistake</i> with 2 prime factors ft $1200 = 20 \times 600 = 2 \times 10 \times 3 \times 200$)))										
2	1200																			
3	600																			
	200																			
	2, 2, 2, 2, 3, 5, 5 or 1200 2 600 3 200 2 100 5 20 5 10 2 2 2 5 2 5 oe <table><tr><td>2</td><td>1200</td></tr><tr><td>3</td><td>600</td></tr><tr><td>2</td><td>200</td></tr><tr><td>5</td><td>100</td></tr><tr><td>2</td><td>20</td></tr><tr><td>5</td><td>10</td></tr><tr><td>2</td><td>2</td></tr><tr><td></td><td>(1)</td></tr></table>	2	1200	3	600	2	200	5	100	2	20	5	10	2	2		(1)			M1 for finding the correct prime factors condone inclusion of 1 (may be seen in a fully correct factor tree or ladder)
2	1200																			
3	600																			
2	200																			
5	100																			
2	20																			
5	10																			
2	2																			
	(1)																			
		$2^4 \times 3 \times 5^2$		A1 (dep on M2 as working requested) Can be in any order (allow $2^4 \cdot 3 \cdot 5^2$) but must be in index form as asked for.																
				Total 3 marks																

6	(a)		1, 2, 5, 10	1	B1	in any order												
	(b)	18, 36, ... and 60, 120, ... or 2 3 3 oe or 2 2 3 5 oe or  or <table border="1" data-bbox="387 1126 525 1225"><tr><td>2</td><td>18</td><td>60</td></tr><tr><td>3</td><td>9</td><td>30</td></tr><tr><td>5</td><td>3</td><td>10</td></tr><tr><td></td><td></td><td>2</td></tr></table> or 2, 2, 3, 3, 5 oe	2	18	60	3	9	30	5	3	10			2		2	M1	for any correct valid method and no errors e.g. for starting to list at least two multiples of each number or 2 3 3 seen or 2 2 3 5 seen (may be in a factor tree or a ladder diagram and ignore 1) or a fully correct Venn diagram or other clear method, e.g. table, not be written as a product
2	18	60																
3	9	30																
5	3	10																
		2																
		Working required	180		A1	accept $2^2 \times 3^2 \times 5$ oe												
						Total 3 marks												

17	e.g. $2 \times 5 \times 225$ or $5 \times 5 \times 90$ or $5^2 \times 90$ $3 \times 5 \times 150$ or $3 \times 3 \times 250$ or $3^2 \times 250$ <table><tr><td>e.g.</td><td>e.g.</td></tr><tr><td><table><tr><td>2</td><td>2250</td></tr><tr><td>5</td><td>1125</td></tr><tr><td></td><td>225</td></tr></table></td><td><table><tr><td colspan="2">2250</td></tr><tr><td>2</td><td>1125</td></tr><tr><td></td><td>5</td></tr><tr><td></td><td>225</td></tr></table></td></tr></table>	e.g.	e.g.	<table><tr><td>2</td><td>2250</td></tr><tr><td>5</td><td>1125</td></tr><tr><td></td><td>225</td></tr></table>	2	2250	5	1125		225	<table><tr><td colspan="2">2250</td></tr><tr><td>2</td><td>1125</td></tr><tr><td></td><td>5</td></tr><tr><td></td><td>225</td></tr></table>	2250		2	1125		5		225		3	M1	for 2 correct stages in prime factorisation with 0 incorrect stages or at least 3 stages in prime factorisation with no more than 1 incorrect stage. Each stage gives 2 factors – may be in a factor tree or a table or listed eg 2, 2, 225 (see LHS for examples of the amount of work needed for the award of this mark). Example of 3 stages with 1 incorrect stage: $2250 = 225 \times 100 = 3 \times 5 \times 15 \times 100$ or $225 = 3 \times 5 \times 15$																		
e.g.	e.g.																																								
<table><tr><td>2</td><td>2250</td></tr><tr><td>5</td><td>1125</td></tr><tr><td></td><td>225</td></tr></table>	2	2250	5	1125		225	<table><tr><td colspan="2">2250</td></tr><tr><td>2</td><td>1125</td></tr><tr><td></td><td>5</td></tr><tr><td></td><td>225</td></tr></table>	2250		2	1125		5		225																										
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	e.g. $2 \times 3 \times 3 \times 5 \times 5 \times 5$ <table><tr><td>e.g.</td><td>e.g.</td></tr><tr><td><table><tr><td>2</td><td>2250</td></tr><tr><td>5</td><td>1125</td></tr><tr><td>3</td><td>225</td></tr><tr><td>5</td><td>75</td></tr><tr><td>3</td><td>15</td></tr><tr><td>5</td><td>5</td></tr><tr><td></td><td>(1)</td></tr></table></td><td><table><tr><td colspan="2">2250</td></tr><tr><td>2</td><td>1125</td></tr><tr><td>5</td><td>225</td></tr><tr><td></td><td>3</td></tr><tr><td></td><td>75</td></tr><tr><td></td><td>5</td></tr><tr><td></td><td>15</td></tr><tr><td></td><td>3</td></tr><tr><td></td><td>5</td></tr></table></td></tr></table>	e.g.	e.g.	<table><tr><td>2</td><td>2250</td></tr><tr><td>5</td><td>1125</td></tr><tr><td>3</td><td>225</td></tr><tr><td>5</td><td>75</td></tr><tr><td>3</td><td>15</td></tr><tr><td>5</td><td>5</td></tr><tr><td></td><td>(1)</td></tr></table>	2	2250	5	1125	3	225	5	75	3	15	5	5		(1)	<table><tr><td colspan="2">2250</td></tr><tr><td>2</td><td>1125</td></tr><tr><td>5</td><td>225</td></tr><tr><td></td><td>3</td></tr><tr><td></td><td>75</td></tr><tr><td></td><td>5</td></tr><tr><td></td><td>15</td></tr><tr><td></td><td>3</td></tr><tr><td></td><td>5</td></tr></table>	2250		2	1125	5	225		3		75		5		15		3		5			M1	for 2, 3, 3, 5, 5, 5 or $2 \times 3 \times 3 \times 5 \times 5 \times 5$ or $2, 3^2, 5^3$ oe or $2 + 3^2 + 5^3$ (ignore 1s) (may be a fully correct factor tree or ladder)
e.g.	e.g.																																								
<table><tr><td>2</td><td>2250</td></tr><tr><td>5</td><td>1125</td></tr><tr><td>3</td><td>225</td></tr><tr><td>5</td><td>75</td></tr><tr><td>3</td><td>15</td></tr><tr><td>5</td><td>5</td></tr><tr><td></td><td>(1)</td></tr></table>	2	2250	5	1125	3	225	5	75	3	15	5	5		(1)	<table><tr><td colspan="2">2250</td></tr><tr><td>2</td><td>1125</td></tr><tr><td>5</td><td>225</td></tr><tr><td></td><td>3</td></tr><tr><td></td><td>75</td></tr><tr><td></td><td>5</td></tr><tr><td></td><td>15</td></tr><tr><td></td><td>3</td></tr><tr><td></td><td>5</td></tr></table>	2250		2	1125	5	225		3		75		5		15		3		5								
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	Working required	$2 \times 3^2 \times 5^3$		A1	dep on M2 can be any order (allow $2 \cdot 3^2 \cdot 5^3$)																																				
					Total 3 marks																																				

17	eg $2 \times 2 \times 350$ or $2 \times 7 \times 100$ or $2 \times 5 \times 140$ or $5 \times 7 \times 40$ or $5 \times 5 \times 56$ or $(14 \times 100 =) 2 \times 7 \times 100$ or $(28 \times 50 = 4 \times 7 \times 50 =) 2 \times 2 \times 7 \times 50 =$ or <table border="1"><tr><td>2</td><td>1400</td></tr><tr><td>2</td><td>700</td></tr><tr><td></td><td>350</td></tr></table>	2	1400	2	700		350		3	M1 for 2 correct stages in prime factorisation with 0 incorrect stages or at least 3 stages in prime factorisation with no more than 1 incorrect stage. Each stage gives 2 factors – may be in a factor tree or a table or listed eg 2, 2, 350 (see LHS for examples of the amount of work needed for the award of this mark). Example of 3 stages with 1 incorrect stage: $1400 = 10 \times 14 = 2 \times 5 \times 2 \times 7$						
2	1400															
2	700															
	350															
	eg 2, 2, 2, 5, 5, 7 <table border="1"><tr><td>2</td><td>1400</td></tr><tr><td>2</td><td>700</td></tr><tr><td>5</td><td>350</td></tr><tr><td>2</td><td>70</td></tr><tr><td>5</td><td>35</td></tr><tr><td></td><td>7</td></tr></table> eg 	2	1400	2	700	5	350	2	70	5	35		7			M1 dep on M1 for $2 \times 2 \times 2 \times 5 \times 5 \times 7$ or $2^3, 5^2, 7$ or $2^3 + 5^2 + 7$ (Ignore 1's) (may be seen in a fully correct factor tree or ladder)
2	1400															
2	700															
5	350															
2	70															
5	35															
	7															
		$2^3 \times 5^2 \times 7$		A1 dep on M2 (do not allow 1 in the final answer) Can be in any order (allow $2^3 \cdot 5^2 \cdot 7$) but must be in index form as asked for.												
	Working required			Total 3 marks												

18	eg $2 \times 2 \times 350$ or $2 \times 7 \times 100$ or $2 \times 5 \times 140$ or $5 \times 5 \times 56$ or $7 \times 5 \times 40$ or $(14 \times 100 = 14 \times 25 \times 4 =) 2 \times 7 \times 25 \times 4$		3	M1 for finding 2 prime factors after at least 2 stages of prime factorisation with 0 incorrect stages or for finding 2 prime factors after at least 3 stages of prime factorisation with no more than 1 incorrect stage Each stage gives 2 factors – may be in a factor tree or a table or listed (see LHS for examples of the amount of work needed for the award of this mark) but we want to see 2 prime factors. Example of finding 2 prime factors after at least 3 stages with 1 incorrect stage: $1400 = 10 \times 14 = 2 \times 5 \times 2 \times 7$										
	eg <table border="1"> <tr><td>2</td><td>1400</td></tr> <tr><td>2</td><td>700</td></tr> <tr><td></td><td>350</td></tr> </table>	2		1400	2	700		350	eg <pre> 1400 / \ 2 700 / \ 2 350 </pre>					
	2	1400												
	2	700												
	350													
eg $2 \times 2 \times 2 \times 5 \times 5 \times 7$ eg <table border="1"> <tr><td>2</td><td>1400</td></tr> <tr><td>2</td><td>700</td></tr> <tr><td>2</td><td>350</td></tr> <tr><td>5</td><td>175</td></tr> <tr><td>5</td><td>35</td></tr> <tr><td></td><td>7</td></tr> </table>	2	1400	2	700	2	350	5	175	5	35		7	eg <pre> 1400 / \ 2 700 / \ 2 350 / \ 2 175 / \ 5 35 / \ 5 7 </pre>	
2	1400													
2	700													
2	350													
5	175													
5	35													
	7													
<i>Working required</i>	$2^3 \times 5^2 \times 7$													
				M1 dep on M1 for factors 2, 2, 2, 5, 5, 7 identified with no others in any form, eg listed, multiplied, added Ignore 1s May be seen in a fully correct factor tree or ladder										
				A1 dep on M2 May be in any order and allow $2^3 \times 5^2 \times 7$										
Total 3 marks														

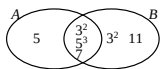
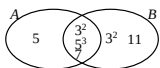
Question	Working	Answer	Mark	Notes
10 a	12, 24, 36... and 20, 40, 60, ... or 2, 2, 3 and 2, 2, 5 (may be on a factor tree oe)	60	2	M1 accept prime factors seen in factor tree or correct position in Venn diagram A1 for 60 or $2 \times 2 \times 3 \times 5$ oe
b	at least 3 of 2, 3, 4, 6, 8, 12 and at least 3 of 2, 4, 7, 8, 14, 28 or 2, 2, 2, 3 and 2, 2, 2, 7 (may be on a factor tree oe)	8	2	M1 accept prime factors seen in factor tree or correct position in Venn diagram A1 for 8 or $2 \times 2 \times 2$ oe
11	$32 \div 5$ (= 6.4 or 6) or $15 \div 5$ (=3) or $30 \div 5$ (=6) “6” $\times$ “3” $\times$ “6” (=108)	No with 108	3	M1 M1 integer values must be used A1 SC: If no marks awarded then award B1 for an answer of ‘yes’ with 115(.2) OR ‘yes’ and 14400 and 13750

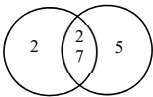
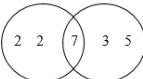
Question	Working	Answer	Mark	Notes
4 (a)	8.4 – 3.8	9.2	1	B1
		4.6	2	M1 At least one correct A1
		Bar correct height	1	B1 1.6 - 1.8 drawn
5 (a)		18	1	B1
		15 18	2	B1, B1
		Any correct pair	1	B1 14 and 15 or 15 and 16 or 15 and 22
6 (a)		(6, 2)	1	B1
		<i>D</i> plotted	1	B1
		Isosceles	1	B1
		(3, 4.5)	2	M1 or one coordinate correct or (4.5, 3) A1
(d)	$\frac{2+4}{2}, \frac{2+7}{2}$			

Question	Working	Answer	Mark	Notes																								
20 (a)	$2 \times 2 \times 2 \times 2 \times 2 \times 3$ or $2 \times 2 \times 2 \times 3 \times 5$ e.g. <table><tr><td>2</td><td>96</td><td>120</td></tr><tr><td>2</td><td>48</td><td>60</td></tr><tr><td>2</td><td>24</td><td>30</td></tr><tr><td>3</td><td>12</td><td>15</td></tr><tr><td></td><td>4</td><td>5</td></tr></table> <table><tr><td>6</td><td>96</td><td>120</td></tr><tr><td>4</td><td>16</td><td>20</td></tr><tr><td></td><td>4</td><td>5</td></tr></table>	2	96	120	2	48	60	2	24	30	3	12	15		4	5	6	96	120	4	16	20		4	5	24	2	M1 for one number written as product of prime factors number may be at the end of factor trees or on 'ladder diagrams or Use of table method (allow 1 error), 2 examples shown but could have 2, 3, 4, 6, 12, 24 along the side or at least 2 factors for each (excluding 1, 96, 120)
	2	96	120																									
2	48	60																										
2	24	30																										
3	12	15																										
	4	5																										
6	96	120																										
4	16	20																										
	4	5																										
(b)		A1 or $2^3 \times 3$ M1 for $2^m \times 3^n \times 5^p \times 7^q \times 11^r$ with at least two of $m = 4, n = 1, p = 2, q = 2, r = 1$ (or omission of one with others fully correct) or prime numbers may be seen in a Venn diagram – if so must be correctly placed or $2^4 \times 3 \times 5^2 \times 7^2 \times 11$ oe																										
21	8500×0.023 (=195.5) or 8500×1.023 (=8695.5) $((8500 + "195.5") \times 1.023) \times 1.023$	9100	3	M1 M2 for 8500×1.023^3 (M1 for 8500×1.023^n) M1 complete method A1 for $9100 - 9100.1$ (answer of 600(.1) gains M2)																								

International GCSE Maths					
Apart from question 9b, 9c (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)		3 or 19 or 51 or 81	1	B1
	(b)		24 or 60	1	B1
	(c)		16 or 81	1	B1
	(d)		3 or 19	1	B1
					Total 4 marks
2	(a)		5	1	B1
	(b)		60	1	B1
	(c)		1000	1	B1
					Total 3 marks

14	(a)	1, 2, 4, 5, 8, 10, 20, 40 and 1, 2, 4, 8, 16, 32, 64 OR $2 \times 2 \times 2 \times 5$ and $2 \times 2 \times 2 \times 2 \times 2$		2	M1 for start to list factors – must be at least 4 for each of 40 and 64 or prime factorisation of both numbers with at least 2 stages correct eg $40 = 2 \times 20 = 2 \times 4 \times 5$ could be numbers on tree or in table
			8		A1
		(b)	$(8 =) 2 \times 2 \times 2$ or 2^3 or 2^{3+n}		2
			$2^{n+3} \times 3 \times 5^m$	A1	
Total 4 marks					

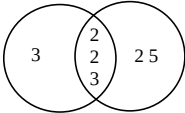
Question		Working	Answer	Mark	Notes	
23	(a)		7875	2	M1	$3^2 \times 5^3 \times 7$ oe or correct Venn diagram
					A1	
	(b)		3 898 125	2	M1	$3^4 \times 5^4 \times 7 \times 11$ oe or correct Venn diagram
					A1	
			Total 4 marks			
24	(a)		8.4×10^5	1	B1	
	(b)	$\frac{600000000}{0.08}$ or 750000000 oe (e.g 0.75×10^9)	7.5×10^8	2	M1	M1 for 60000000 or 0.08
					A1	
			Total 3 marks			
25		150000×0.82^3	82705	3	M2	If not M2 then M1 for 1st year e.g $150000 \times 0.82 \{= 123000\}$ or $150000 \times 0.18 \{= 27000\}$ SC B1 for $150000 \times 1.18 \{= 177000\}$ or $150000 \times 1.18^3 \{= 246454.8\}$ or $150000 \times 0.54 \{= 81000\}$ or $150000 \times 0.46 \{= 69000\}$
					A1	Accept 82705.2
			Total 3 marks			

15	(a)	1, 2, 4, 7, 14, 28 and 1, 2, 5, 7, 10, 14, 35, 70 or $2 \times 2 \times 7$ and $2 \times 5 \times 7$ or 		2	M1 for starting to list at least four factors of each number or 2, 2, 7 and 2, 5, 7 seen (may be in a factor tree and ignore 1) or a fully correct Venn diagram
			14		A1 cao
	(b)	28, 56, 84, 112... and 105, 210, 315, 420... or 2, 2, 7 and 3, 5, 7 or  or $\frac{28 \times 105}{7}$ or 2, 2, 3, 5, 7 oc		2	M1 for any correct valid method e.g. for starting to list at least four multiples of each number or 2, 2, 7 and 3, 5, 7 seen (may be in a factor tree and ignore 1) or a fully correct Venn diagram
			420		A1 cao
Total 4 marks					

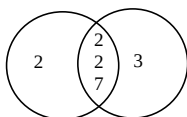
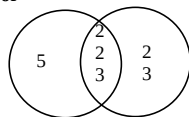
23	$(5 - 2) \times 180 \div 5 (= 108)$ or $360 \div 5 (= 72)$		5	M1	for method to find an interior or exterior angle of a pentagon
	$(6 - 2) \times 180 \div 6 (= 120)$ or $360 \div 6 (= 60)$			M1	for method to find an interior or exterior angle of a hexagon
	$360 - 108 - 120 (= 132)$ or $60 + 72 (= 132)$ or $(180 - '120') + (180 - '108')$			M1	dep on M2 for a correct method to find angle <i>EDI</i> using correct figures
	$360 - '72' - '60' - '132' (= 96)$			M1	for a complete method to find angle <i>x</i>
		96		A1	dep on correct working
				Note:	Angles may be seen on diagram throughout
Total 5 marks					

24	a		$2^6 \times 3 \times 11^4$	2	B2	oe, accept 2811072
					B1	for $2^a \times 3^b \times 11^c$ oe where two of a, b and c are correct
	b		$2^9 \times 3^5 \times 11^8$	2	B2	cao
					B1	for $2^a \times 3^b \times 11^c$ oe where two of a, b and c are correct or $2.666... \times 10^{13}$ or an equivalent expression for e.g. $2^2 \times 2^7 \times 3^5 \times 11^3 \times 11^5$
Total 4 marks						

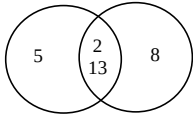


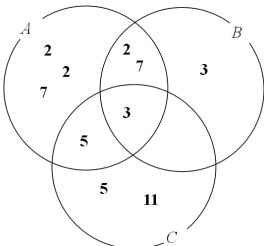
20	(a)	36, 72, 108, ... and 120, 240, 360, ... or 2, 2, 3, 3 and 2, 2, 2, 3, 5 or <table border="1" data-bbox="614 952 751 1043"><tr><td>2</td><td>36</td><td>120</td></tr><tr><td>2</td><td>18</td><td>60</td></tr><tr><td>3</td><td>9</td><td>30</td></tr><tr><td></td><td>3</td><td>10</td></tr></table> or $\frac{36 \times 120}{12}$ or 2, 2, 2, 3, 3, 5 oe	2	36	120	2	18	60	3	9	30		3	10	2	M1 for any correct valid method e.g. for starting to list at least three multiples of each number 2, 2, 3, 3 and 2, 2, 2, 3, 5 seen (may be in a factor tree or a ladder diagram and ignore 1) (Allow 2×2 as 4) or a fully correct “Venn” diagram
2	36	120														
2	18	60														
3	9	30														
	3	10														
			360		A1 or $2^3 \times 3^2 \times 5$ oe (allow $2^3 \cdot 3^2 \cdot 5$)											
	(b)		$5^2 \times 7^4 \times 11$	2	B2 for $5^2 \times 7^4 \times 11$ (in any order) (B1 for 660 275 or correct unsimplified product or $5^a \times 7^b \times 11^c$ where 2 of a, b and c are correct)											
					Total 4 marks											

17	$1 - (0.26 + 0.18) (= 0.56)$ oe or 0.28 oe or $x + x = 1 - (0.26 + 0.18)$ oe		4	M1 0.28 oe may be seen in the table
	$45 \div 0.18 (= 250)$ oe or $\frac{45}{18} (= 2.5)$ oe " 0.56 " $\frac{0.56}{2} \div 0.18 \left(= \frac{14}{9} = 1.55\ldots \right)$ oe or " 56 " $\frac{56}{2} \div 18 \left(= \frac{14}{9} = 1.55\ldots \right)$			M1
	" 250 " $\times \frac{0.56}{2}$ oe or $2.5 \times \frac{56}{2}$ oe or " 250 " $\times$ " 0.28 " oe or " 0.28 " $\div 0.18 \times 45$ oe or " $\frac{14}{9}$ " $\times 45$ oe or " 28 " $\div 18 \times 45$ oe or $\frac{45}{18} \times$ " 28 " oe			M1
		70		A1 ($\frac{70}{250}$ scores M3A0)
				Total 4 marks

18	(a)	1, 2, 4, 7, 8, 14, 28, 56 and 1, 2, 3, 4, 6, 7, 12, 14, 21, 28, 42, 84 or 2 2 2 7 and 2 2 3 7 or  <table data-bbox="612 871 751 943"><tr><td colspan="3">e.g.</td></tr><tr><td>28</td><td>56</td><td>84</td></tr><tr><td></td><td>2</td><td>3</td></tr></table>	e.g.			28	56	84		2	3		2	M1 for any correct valid method and no errors e.g. for starting to list at least four different factors of each number and no errors or 2 2 2 7 and 2 2 3 7 seen (may be in a factor tree or a ladder diagram and ignore 1) or a fully correct Venn diagram or other clear method, e.g, table						
e.g.																				
28	56	84																		
	2	3																		
			28		A1 dep M1 accept $2^2 \times 7$ oe															
	(b)	60, 120, 180, 240... and 72, 144, 216, 288... or 2 2 3 5 and 2 2 2 3 3 or  <table data-bbox="612 1117 751 1238"><tr><td>2</td><td>60</td><td>72</td></tr><tr><td>2</td><td>30</td><td>36</td></tr><tr><td>3</td><td>15</td><td>18</td></tr><tr><td>2</td><td>5</td><td>6</td></tr><tr><td></td><td></td><td>3</td></tr></table> or $\frac{60 \times 72}{12}$ or 2, 2, 2, 3, 3, 5 oe	2	60	72	2	30	36	3	15	18	2	5	6			3		2	M1 for any correct valid method and no errors e.g. for starting to list at least four multiples of each number or 2 2 3 5 and 2 2 2 3 3 seen (may be in a factor tree or a ladder diagram and ignore 1) or a fully correct Venn diagram or other clear method, e.g, table
2	60	72																		
2	30	36																		
3	15	18																		
2	5	6																		
		3																		
			360		A1 dep M1 accept $2^3 \times 3^2 \times 5$ oe															
					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 7×3 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 ± 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 for $x = 5$ B1 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

12	(a)	e.g. $\frac{21}{24} - \frac{10}{24}$ or $\frac{84}{96} - \frac{40}{96}$ or $\frac{21n}{24n} - \frac{10n}{24n}$		2	M1 for finding a common denominator of 24 or a multiple of 24 with at least one fraction correct																					
		e.g. $\frac{21}{24} - \frac{10}{24} = \frac{11}{24}$ $\frac{84}{96} - \frac{40}{96} = \frac{44}{96} = \frac{11}{24}$ or $\frac{21n}{24n} - \frac{10n}{24n} = \frac{11n}{24n} = \frac{11}{24}$	Shown		A1 dep on M1, for a complete method leading to $\frac{11}{24}$																					
	(b)	2, 5, 10, 13, 26, 65 and 2, 4, 8, 16, 26, 52, 104 or 2, 5, 13 and 2, 2, 2, 2, 13 oe  or <table border="1" data-bbox="387 1232 547 1299"><tr><td colspan="3">e.g.</td></tr><tr><td>26</td><td>130</td><td>208</td></tr><tr><td></td><td>5</td><td>8</td></tr></table> <table border="1" data-bbox="590 1232 750 1323"><tr><td colspan="3">e.g.</td></tr><tr><td>2</td><td>130</td><td>208</td></tr><tr><td>13</td><td>65</td><td>104</td></tr><tr><td></td><td>5</td><td>8</td></tr></table>	e.g.			26	130	208		5	8	e.g.			2	130	208	13	65	104		5	8		2	M1 for starting to list at least two factors of each number excluding 1 and <i>n</i> (Two factors may be written as, for e.g., $130 \div 26 = 5$ and $208 \div 26 = 8$ oe or $130 \div 13 = 10$ and $208 \div 13 = 16$ etc) or 2, 5, 13 and 2, 2, 2, 2, 13 seen (may be in a factor tree or a ladder diagram and ignore 1) or a fully correct Venn diagram oe or other clear method, e.g. table
e.g.																										
26	130	208																								
	5	8																								
e.g.																										
2	130	208																								
13	65	104																								
	5	8																								
		<i>Working required</i>	26		A1dep on M1																					
					Total 4 marks																					

21	(a)	$2 \times 2 \times 2 \times 5 \times 5$ or 2, 2, 2, 5, 5 or $2 \times 2 \times 3 \times 5 \times 7$ or 2, 2, 3, 5, 7 or eg <table><tr><td>2</td><td>200</td><td>420</td></tr><tr><td>2</td><td>100</td><td>210</td></tr><tr><td>5</td><td>50</td><td>105</td></tr><tr><td></td><td>10</td><td>21</td></tr></table>	2	200	420	2	100	210	5	50	105		10	21		2	M1 for one number written as a product of prime factors or prime factors listed – numbers may be at end of factor trees or on ‘ladder diagrams’ or in a table or in a Venn diagram or at least two factors for each (excluding 1, 200, 420)
	2	200	420														
2	100	210															
5	50	105															
	10	21															
		Correct answer scores full marks (unless from obvious incorrect working)	20		A1 or $2^2 \times 5$ oe												
	(b)			2	M1 for $2^m \times 3^n \times 5^p \times 7^q \times 11^r$ with at least three of $m = 3, n = 2, p = 2, q = 2, r = 1$ (all 5 terms should be seen) or omission of one term with others fully correct OR prime factors seen in a Venn diagram – if so must be fully correct												
		Correct answer scores full marks (unless from obvious incorrect working)	$2^3 \times 3^2 \times 5^2 \times 7^2 \times 11$		A1 allow 970 200 oe												
Total 4 marks																	

23	(a)	eg $2 \times 2 \times 75$ or $3 \times 5 \times 20$ or $2 \times 3 \times 50$ or $5^2 \times 12$ or <table><tr><td>2</td><td>300</td></tr><tr><td>2</td><td>150</td></tr><tr><td></td><td>75</td></tr></table>	2	300	2	150		75		2	M1 for 2 correct stages in prime factorisation with 0 incorrect stages or at least 3 stages in prime factorisation with no more than 1 incorrect stage. Each stage gives 2 factors – may be in a factor tree or a table or listed eg 2, 2, 75 (see LHS for examples of the amount of work needed for the award of this mark). Example of 3 stages with 1 incorrect stage: $300 = 100 \times 30 = 2 \times 50 \times 5 \times 6$
2	300										
2	150										
	75										
		Working required	$2 \times 2 \times 3 \times 5 \times 5$		A1 dep on M1, oe eg $2^2 \times 3 \times 5^2$						
	(b)	(5A =) $2 \times 2 \times 2 \times 3 \times 3 \times 5 \times 5$ oe (= 1800) or (5A =) $2^3 \times 3^2 \times 5^2$ (= 1800) or (7B =) $2 \times 2 \times 3 \times 3 \times 3 \times 5 \times 7$ oe (= 3780) or (7B =) $2^2 \times 3^3 \times 5 \times 7$ (= 3780)		2	M1 for method to find 5A or 7B as prime factors (may be seen in factor tree, table or Venn diagram) or as an integer or for listing at least 3 multiples of each number eg 1800, 3600, 5400... and 3780, 7560, 11340... or for an answer of 1080 oe eg $2^3 \times 3^3 \times 5$						
		Working required	37800		A1 dep on M1, oe eg $2^3 \times 3^3 \times 5^2 \times 7$						
Total 4 marks											

7	(a)		12ac	1	B1
	(b)		$5d - 2e$	2	B2 for $5d - 2e$ oe (B1 for $5d$ or $-2e$)
	(c)	$4x = 23 + 7$ or $4x = 30$ oe or $x - \frac{7}{4} = \frac{23}{4}$ or $(23 + 7) \div 4$ or $30 \div 4$		2	M1 for a correct first step or a correct calculation for x
		Correct answer scores full marks (unless from obvious incorrect working)	7.5		A1 oe eg $\frac{15}{2}$, $7\frac{1}{2}$, $\frac{30}{4}$
Total 5 marks					

8	(a)		97	1	B1
	(b)		43	1	B1
	(c)	16 or 125		2	M1 for sight of 16 or 125
		Correct answer scores full marks (unless from obvious incorrect working)	2000		A1
Total 4 marks					

17	9, 18, 27, 36 and 12, 24, 36 or 36 or a multiple of 36 or (9 × 12 =) 108 or $3^2 \times 4$ (= 36) (from Venn diagram or table)		4	M1 for at least two multiples of 9 and 12 or 36 or a multiple of 36																					
	“4” × 7.6(0) or “3” × 4.8(0) or “30.4” or “14.4” or “4n” × 7.6(0) or “3n” × 4.8(0)			M1 for a correct method to find the cost of 4 or 8 or 12 etc of packets of pens or 3 or 6 or 9 etc packets of pencils																					
	“4” × 7.6(0) + “3” × 4.8(0) or “30.4” + “14.4” or “4n” × 7.6(0) + “3n” × 4.8(0)			M1 for a correct combination of number of packets of pens × 7.6(0) + number of packets of pencils × 4.8(0) with an intention to add, eg <table><tr><td>pens</td><td>pencils</td><td></td></tr><tr><td>4 × 7.60 +</td><td>3 × 4.8 =</td><td>44.8(0)</td></tr><tr><td>8 × 7.60 +</td><td>6 × 4.8 =</td><td>89.6(0)</td></tr><tr><td>12 × 7.60 +</td><td>9 × 4.8 =</td><td>134.4(0)</td></tr><tr><td>16 × 7.60 +</td><td>12 × 4.8 =</td><td>179.2(0)</td></tr><tr><td>36 × 7.60 +</td><td>27 × 4.8 =</td><td>403.2(0)</td></tr><tr><td>48 × 7.60 +</td><td>36 × 4.8 =</td><td>537.6(0)</td></tr></table>	pens	pencils		4 × 7.60 +	3 × 4.8 =	44.8(0)	8 × 7.60 +	6 × 4.8 =	89.6(0)	12 × 7.60 +	9 × 4.8 =	134.4(0)	16 × 7.60 +	12 × 4.8 =	179.2(0)	36 × 7.60 +	27 × 4.8 =	403.2(0)	48 × 7.60 +	36 × 4.8 =	537.6(0)
pens	pencils																								
4 × 7.60 +	3 × 4.8 =	44.8(0)																							
8 × 7.60 +	6 × 4.8 =	89.6(0)																							
12 × 7.60 +	9 × 4.8 =	134.4(0)																							
16 × 7.60 +	12 × 4.8 =	179.2(0)																							
36 × 7.60 +	27 × 4.8 =	403.2(0)																							
48 × 7.60 +	36 × 4.8 =	537.6(0)																							
	Correct answer scores full marks (unless from obvious incorrect working)	44.8(0)		A1 allow 45 if 44.8(0) seen allow 4480 p or pence if £ sign crossed out M3A0 for 44.8n where n is an integer (eg 134.4(0))																					
				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

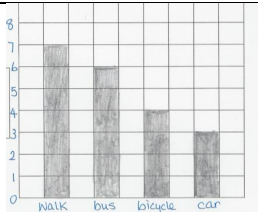


Question	Working	Answer	Mark	Notes
23	eg $8x + 4y = 18 +$ or $4x + 2y = 9 -$ $x - 4y = 9$ $4x - 16y = 36$ or $4(9 + 4y) + 2y = 9$ eg $4 \times "3" + 2y = 9$ or $4x + 2 \times "-1.5" = 9$ or $x = 9 + 4 \times "-1.5"$	$x = 3,$ $y = -1.5$	3	M1 correct method to eliminate x or y : coefficients of x or y the same and correct operation to eliminate the selected variable (condone any one arithmetic error in multiplication) or writing x or y in terms of the other variable and correctly substituting M1 (dep) correct method to find second variable using their value from a correct method to find first variable or for repeating above method to find second variable A1 oe, dep first M1
24 (a)		4.8×10^{11}	1	B1
(b)		$2^{14} \times 3 \times 5^{10}$	3	B3 for the correct answer B2 for an answer in the form $2^m \times 3 \times 5^n$, where m and n are positive integers B1 for at least 2 correct steps in repeated prime factorisation (including tree diagram)
(c)		29 296 875	1	B1 Accept 3×5^{10} , 2.9296875×10^7



18	(a)		7	1	B1
	(b)	e.g. $720 = 2 \times 360 = 2 \times 2 \times 180$ or $720 = 3 \times 240 = 3 \times 3 \times 80$ etc		3	M1 At least 2 correct stages in prime factorisation
		2, 2, 2, 2, 3, 3, 5			M1 condone inclusion of 1 (may be a fully correct factor tree or ladder)
			$2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 5$		A1 dep on M2, accept $2^4 \times 3^2 \times 5$
	(c)		5	1	B1
					Total 5 marks

International GCSE Maths					
The correct answer, unless obtained from an incorrect method, should be taken to imply a correct method.					
Question		Working	Answer	Mark	Notes
1	(a)		44	1	B1
	(b)		6	1	B1
	(c)		36	1	B1
	(d)		17	1	B1
	(e)		8, 76	1	B1 Must have both and no others
					Total 5 marks

2	(a)	<table><tr><th>Transport</th><th>Tally</th><th>Frequency</th></tr><tr><td>walk</td><td> </td><td>7</td></tr><tr><td>bus</td><td> </td><td>6</td></tr><tr><td>bicycle</td><td> </td><td>4</td></tr><tr><td>car</td><td> </td><td>3</td></tr></table>	Transport	Tally	Frequency	walk		7	bus		6	bicycle		4	car		3	2	B2	for all correct frequencies (B1 for 2 or 3 correct frequencies or 2, 3 or 4 correct tallies with no frequencies (or incorrect frequencies) or frequencies written as probabilities with 2, 3 or 4 correct numerators)
	Transport	Tally	Frequency																	
walk		7																		
bus		6																		
bicycle		4																		
car		3																		
(b)		3	B2 ft	For 4 correct bars ft from table (B1ft for 2 or 3 correct bars ft from table)																
				B1	For clear labels for bars and linear scale starting at 0 oe Condone bars of different widths															
					Total 5 marks															

International GCSE Maths				
Apart from Questions 5b 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)(i)		10 or 28	1	B1 accept 10 or 28 or 10 and 28
(ii)		27	1	B1
(iii)		23	1	B1
(b)(i)		3578	1	B1
(ii)		57 + 38 or 37 + 58	1	B1
				Total 5 marks
2 (a)		Isosceles	1	B1
(b)		Correct lines of symmetry drawn	1	B1 with no additional lines
(c)		5	1	B1
				Total 3 marks

4	(a)		Pentagon	1	B1
	(b)		Marked at 360	1	B1
	(c)		1 45	1	B1 oe e.g. 1345, quarter to two/2 Ignore any am or pm
	(d)		centimetres	1	B1 or cm
Total 4 marks					

5	(a)(i)		6 or 8	1	B1 allow 6 and 8
	(ii)		27	1	B1 cao
	(iii)		25	1	B1 cao
	(iv)		3 or 7 or 11	1	B1 allow two or more of 3, 7, 11
	(b)	$(2^2 + 5) \times (2 + 3^2) = 99$	Two correct pairs of brackets	1	B1 cao
Total 5 marks					

6	(a)(i)		132	1	B1 cao
	(ii)		correct reason	1	B1 for <u>angles</u> on a straight <u>line</u> add up to 180 Accept angles on a straight <u>line</u> add up to 180
	(b)	$180 \div 3 (= 60)$		3	M1 or for an angle of 60 in the triangle
		$360 - (105 + 125 + "60")$			M1 for a correct complete method
			70		A1
Total 5 marks					

International GCSE Maths				
Apart from Question 21, 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)		15	1	B1
(b)		18	1	B1
(c)		16	1	B1
(d)		2	1	B1
(e)		8 and 18	1	B1
				Total 5 marks
2 (a)		Unlikely	1	B1 Tick at
(b)		Evens	1	B1 Tick at
(c)		Impossible	1	B1 Tick at
				Total 3 marks
3 (a)		Prism	1	B1 Accept pentagon(al) prism
(b) (i)		7	1	B1
(ii)		10	1	B1
(c)	$\pm(70 - 8 \times 5)$ or $- 30$ or $70 - 5 - 5 - 5 - 5 - 5 - 5 - 5 - 5$ oe		2	M1 Could be done in 2 parts
	Correct answer scores full marks (unless from obvious incorrect working)	30		A1
				Total 5 marks

5	(a)(i)		9	1	B1 cao
	(ii)		24	1	B1 cao
	(iii)		8	1	B1 cao
	(iv)		2	1	B1 cao
	(b)		76	1	B1 cao
					Total 5 marks

6	(a)(i)		125	1	B1 cao
	(ii)		correct reason	1	B1 for <u>Angles</u> around a <u>point</u> add up to 360° or Angles around a <u>point</u> add up to 360°
	(b)	$ABD = 180 - 54 (= 126)$ or $BDC = 180 - 2 \times 54 (= 72)$ or $BDC = 180 - 108 (= 72)$		3	M1 NB If angles are on the diagram they must be correctly assigned or if angle notation is used it must be correctly assigned
		$360 - (98 + 90 + "126")$ or $360 - (98 + 90 + 54 + "72")$ or $360 - 314$			M1 for a complete method
		<i>Working not required, so correct answer scores full marks (unless from obvious incorrect working)</i>	46		A1
					Total 5 marks

Question	Working	Answer	Mark	Notes
7	(a)	97	1	B1
	(b)	729	1	B1
	(c)	19	1	B1
	(d)(i)	$\frac{\sqrt{91.21}}{2.46} = \frac{9.55...}{2.46}$		M1 for 9.55(039...) or 2.46 or 91.21 or 3.8 or 3.9 or 3.88 or 3.882
		3.8822 (7344)	2	A1
	(d)(ii)	3.9	1	B1 ft if at least 2dp in (i)
8	(a)	$6e - 10f$ oe	2	M1 for $6e$ or $-10f$ A1 do not award if in incorrect attempt at simplification is seen eg $-4ef$
	(b)	$20x + 15 - 3x + 1$		M1 for 3 correct terms
		$17x + 16$	2	A1 SC : B1 for $5x + 20$
	(c)	$2p(2 + 3q)$	2	B2 If not B2 then award B1 for $2(2p + 3pq)$ or $p(4 + 6q)$ or $2p$ (a two term expression) or $x(2 + 3q)$ where $x \neq 2p$

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 $x \div 5$ where x is found value from first stage $(108 - 3) \div 5$ oe		2	M1 Allow $108 - 3 \div 5$ or $- 3 \div 5$ with the correct order indicated eg with arrows
		21		A1 cao If no marks scored 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				

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 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 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 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 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 A1 for $\frac{14}{24}$ oe and then $\frac{7}{12}$



5			CO, CM, CW, EO, EM, EW, TO, TM, TW	2	B2 for all combinations with no repeats or incorrect combinations 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. $\frac{3}{4} \times \frac{16}{15} = \frac{48}{60} = \frac{4}{5}$ or $\frac{12}{16} \div \frac{15}{16} = \frac{12}{15} = \frac{4}{5}$ 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
6	$350 \times 91 (= 31\,850)$ or $28\,938 \div 91 (= 318)$		3	M1 for converting one cost to the other currency
	$"31\,850" - 28\,938 (= 2912)$ or $350 - "318" (= 32)$			M1 for finding difference, accept $28\,938 - "31\,850" (= -2912)$ or $"318" - 350 (= -32)$
	<i>Working not required, so correct answer scores full marks (unless from obvious incorrect working)</i>	2912 rupees or £32		A1 must include units
Total 3 marks				

Question	Working	Answer	Mark	Notes
7		FB, FC, FL, FR, PB, PC, PL, PR, SB, SC, SL, SR	2	B2 for all 12 combinations and no extras or repeats If not B2 then B1 for at least 4 correct combinations (ignoring repeats and extras)
Total 2 marks				

8	for at least two of: 8, 200, 0.5		3	M1
	$\frac{1600}{0.5}$ or 8×400 or 16×200			M1
		3200		A1 dep M1 (allow 3000)
				Total 3 marks

9	(a)(i)	58	1	B1
	(ii) Vertically <u>opposite angle(s)</u> are equal or <u>Vertically opposite</u>		1	B1 reason given dep on a correct angle in (i)
	(b) $DBA = 180 - 132 (= 48)$ or for $132 - 58$		2	M1 48 could be shown clearly on diagram
		74		A1
				Total 4 marks

10		BB, BH, BA RB, RH, RA SB, SH, SA	2	B2 for all 9 combinations with no extras or repeats. (B1 for at least 5 correct combinations (ignoring extras and repeats))
				Total 2 marks

10	$12 \times 11.75 (= 141)$		3	M1
	$(181 - '141') \div 5$			M1
		8(.00)		A1
Total 3 marks				

11		TV, TB, TT, NV, NB, NT, HV, HB, HT	2	B2 for all combinations with no repeats or incorrect combinations 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				



11	(a)	c^6	1	B1
	(b)	$6h^3$	1	B1
	(c)	$x^2 + 5x$	1	B1
	(d)	$3(3y - 4)$	1	B1
	(e)	$T = 15m + 40p$	3	B3 ((B2 for $15m + 40p$ or $T = 15m + xp$ or $T = ym + 40p$ or $T = 40m + 15p$) (B1 for $15m + xp$ or $ym + 40p$ or $40m + 15p$ or for $T =$ an incorrect expression in m and p eg $T = mp$) Allow $15 \times m$ or $m15$ etc
Total 7 marks				

12	$1342 \div 11 (=122)$ or $125 \times 11 (=1375)$		3	M1
	$125 - "122" (=3)$ or $"1375" - 1342 (=33)$			M1
		3 euros or 33 (Swedish) Krona		A1 Answer must have correct units which may be shortened eg € or SK or krona
Total 3 marks				

13		BO, BA, BW, FO, FA, FW, CO, CA, CW	2	B2 B2 all correct combinations with no repeats or errors (B1 for at least 4 correct combinations ignoring repeats)
Total 2 marks				



8		DL, DP, DR, HL, HP, HR, JL, JP, JR, SL, SP, SR	2	B2 for all 12 combinations with no extras or repeats If not B2 then B1 for at least 4 correct combinations (ignoring extras and repeats)
				Total 2 marks
9	(a)		20 30	1
	(b)	eg 10:50am + 45mins = 11:35am or 10:50am + 1hr10mins = 12:00pm or 2:20pm - 45mins = 1:35pm or 2:20pm - 1hr10mins = 1:10pm or 45mins + 1hr10mins = 1hr55mins or 115mins or 10:50am to 2:20pm = 3hr30mins or 210mins		3
		eg 10:50am + 45mins + 1hr10mins = 12:45pm or 10:50am + 1hr55mins = 12:45pm or 2:20pm - 45mins - 1hr10mins = 12:25pm or 2:20pm - 1hr55mins = 12:25pm		
		Correct answer scores full marks (unless from obvious incorrect working)	95	
				Total 4 marks



7	(a)		$45cd$	1	B1 oe Allow $45dc$, $c45d$, $d45c$, $cd45$ or $dc45$ Allow upper case letters
	(b)		$-2p + 8n$	2	B2 oe eg. $8n - 2p$ If not B2 then award B1 for $-2p$ or $8n$
	(c)	8×9 and $(-6) \times 5$ oe or 72 and ± 30 oe		2	M1
			42		A1 SCB1 for -14
	(d)	$5m = 17 + 6$ or $5m = 23$ or $m - \frac{6}{5} = \frac{17}{5}$ or $m - 1.2 = 3.4$ or $-17 - 6 = -5m$ or $-23 = -5m$ or $(17 + 6) \div 5$ oe		2	M1 for a correct first step or a calculation for m
		$4 - 3$	$\frac{23}{5}$		A1 oe eg. 4.6 Allow 4,6
Total 7 marks					

8			AE, AP, AW, EP, EW, PW	2	B2 for all combinations with no repeats or incorrect combinations (Allow lower case letters) If not B2 then award B1 for at least 4 correct combinations (ignore repeats or incorrect combinations)
Total 2 marks					

9	$360 - 296 (= 64)$			4	M1 allow angles on the diagram
	$180 - ("64" + 42) (= 74)$				M1
	$(180 - ("64" + 42)) \div 2$ or $"74" \div 2$				M1
		37			A1
Total 4 marks					

12	12 420 ÷ 54(=230) or 232 × 54 (=12 528)		3	M1	
	232 – “230” (=2) or “12 528” – 12 420(=108)			M1	
	Correct answer scores full marks (unless from obvious incorrect working)	2 (Aus)dollars or 108 rupees		A1 Answer must have correct units which may be shortened eg \$ or r (allow incorrect spelling if meaning is clear)	
				Total 3 marks	
13		JW, JY, BW, BY, HW, HY, SW, SY	2	B2 B2 all correct combinations with no repeats and no incorrect combinations (B1 for at least 4 correct combinations ignoring repeats or incorrect combinations)	
				Total 2 marks	
14	(a)		rotation	2	B1 oe with no mention of reflection, translation, enlargement, move, flip etc
			180° (or half turn) about (0, 0) or O or ‘the origin’		B1 (SC B2 for “enlargement centre origin SF – 1”) (ignore any reference to clockwise/anticlockwise)
	(b)	(2, –3) (2, –5) (5, –3) (5, –4)	A correct shape	2	B2 (B1 for a ‘correct’ shape reflected in any horizontal line or a correct reflection in the line $x = -1$ or for shape B reflected in $y = -1$)
					Total 4 marks



9	(a)		CM, CJ, CT, FM, FJ, FT, PM, PJ, PT	2	B2 for correct outcomes listed with no repeats and no extras (B1 for 5, 6, 7 or 8 correct outcomes listed, ignore repeats and ignore extras or for 9 correct outcomes listed, ignore repeats and ignore extras)
	(b)		$\frac{4}{7}$	1	B1 oe
					Total 3 marks

10	(a)		40	1	B1
	(b)	19.20 ÷ 0.80 (= 24) oe		2	M1 for a method to find the number of kilometres she drove
		Correct answer scores full marks (unless from obvious incorrect working)	15		A1 cao
					Total 3 marks

19	e.g. $30 \times 20 \times 125 (= 75\,000)$ or $85 \times 40 \times 125 (= 425\,000)$ or $(60 \times 30 + (85 - 30) \times 40) \times 125 (= 500\,000)$ oe		4	M1	for a method to find the volume of water already pumped out or the volume of water left or the total volume of the container
	"75 000" $\div$ 1.5 (= 50 000) or "75 000" $\div$ 90 (= 833.3... or $\frac{2500}{3}$) or " $425000 \div 75000$ " (= 5.66... or $\frac{17}{3}$) or " $500000 \div 75000$ " (= 6.66... or $\frac{20}{3}$)			M1	M2 for " $\frac{425000}{75000} \times 1.5$ oe (= 8.5) or " $\frac{500000}{75000} \times 1.5$ oe (= 10)
	"425 000" $\div$ "50 000" (= 8.5) or " $425\,000 \div (833.3... \times 60)$ oe (= 8.5) or " $5.66... \times 1.5 (= 8.5)$ or " $6.66... \times 1.5 (= 10)$			M1	
		20 30		A1	Allow 8 30 (pm)
					Total 4 marks

20	(i)		21, 27	1	B1
	(ii)		21, 23, 24, 25, 27, 29	1	B1
					Total 2 marks



16	Ext $\angle = 180 - 162 (= 18)$ oe or $\frac{(n-2)180}{n} = 162$ oe		3	M1
	$360 \div "18"$ oe or $18n = 360$			M1
		20		A1
				Total 3 marks

17	(i)	12, 18	1	B1
	(ii)	12, 14, 15, 16, 18, 20	1	B1
	(iii)	11, 13, 15, 17, 19	1	B1
				Total 3 marks

16	a	e.g. $d - g = 2ac$ $\frac{d}{2c} = \frac{g}{2c} + a$			M1 for a correct first step e.g. subtract g from both sides OR divide all terms by 2 OR divide all terms by c OR divide all terms by $2c$
			$a = \frac{d - g}{2c}$	2	A1 oe
	b		$3f(3e - 4)$	2	B2 (B1 for $3(3ef - 4f)$ or $f(9e - 12)$ or $3f(ke - 4)$ or $3f(3e - m)$ where $k \neq 0$ and $m \neq 0$)
	c	$x^2 - 5x + 2x - 10$			M1 for any 3 correct terms or for 4 out of 4 correct terms ignoring signs or $x^2 - 3x \dots$ or for $\dots - 3x - 10$
			$x^2 - 3x - 10$	2	A1
	d	$\frac{n^{11}}{n^5}$ OR $n^{-1} \times n^7$ OR $n^4 \times n^2$ OR $n^4 \times n^7 \times n^{-5}$ OR $n^{''11''} \div n^5 = n^{(''11'' - 5)}$			M1 for simplifying two terms
			n^6	2	A1
Total 8 marks					

17	ai		b, l, u, e, g, r, y	1	B1 No incorrect or repeats
	aii		w, h, i, t	1	B1 No incorrect or repeats
	b		No with reason	1	B1 eg 'e is in all three sets' OR 'all three sets share a member' OR $B \cap G \cap W = (\{)e(\{)$
Total 3 marks					



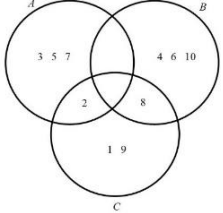
14	(a) (i)		24, 30	1	B1 No repeats
	(ii)		21, 23, 25, 27, 29	1	B1 No repeats
	(b)		$(A \cup B)'$ or $A' \cap B'$	1	B1 or $(B \cup A)'$ or $B' \cap A'$
					Total 3 marks
15	(a)		$81k^8$	2	B2 B1 for 81 or k^8 seen in their final answer.
	(b)		$7m^4n^6$	2	B2 B1 for $7m^4$ or n^6 in a product with no other terms in m or n
					Total 4 marks
16	(a)	vertices at $(-9, 6)$ $(-9, 9)$ $(-3, 9)$ $(-6, 6)$	Shape in correct position	2	B2 B1 for congruent shape in correct orientation but wrong position or quadrilateral with 2 or 3 vertices correct.
	(b)	vertices at $(7, 3)$ $(10, 6)$ $(13, 6)$ $(13, 3)$	Shape in correct position	1	B1
	(c)		enlargement	3	B1 for enlargement, enlarge, etc so long as no mention of rotation, reflection or translation, flip, move etc.
			scale factor 2 centre $(-3, 3)$		B1 SF 2, double, two times etc. B1 $(-3, 3)$ stated. Accept about, from etc. with no mention of line, or column vector.
					Total 6 marks

Question	Working	Answer	Mark	Notes
17	$180 + 149$ or $360 - 31$			M1
	<i>Working not required, so correct answer scores full marks</i>	329	2	A1
				Total 2 marks

Question	Working	Answer	Mark	Notes
18 (a)(i)	other seen orders of letters: a, b, d, e, i, l, n, r, z b, r, l, a, e, z, l, n, d	b, r, a, z, i, l, e, n, d	1	B1 no repeats, letters can be in any order. Condone capital letters rather than lower case letters. (no need for commas)
(ii)		b, z	1	B1 No repeats, letters can be in any order. Condone capital letters. (no need for commas)
(b)		correct explanation that shows they know the meaning of intersection and empty set	1	B1 eg letter 'a' is in both sets $B \cap K = \{a\}$ Set B and set K have an element (or letter) in common. There is a letter that is in set B and in set K There is an intersection so it isn't the null set There is a letter in common (do not allow 'letters' or 'elements' (plural) in common) (If students mention the letter that is in common, it must be the correct one (ie a))
				Total 3 marks

21	(a)		2 3 5 7	1	B1 All numbers must be present with no repeats and no other numbers. Numbers can be in any order Allow commas, colons, etc, between the numbers
	(b)		3 7	1	B1 Both numbers must be present with no repeats and no other numbers. Numbers can be in any order Allow commas, colons, etc, between the numbers
	(c)		2 4 5 6 8	1	B1 All numbers must be present with no repeats and no other numbers. Numbers can be in any order Allow commas, colons, etc, between the numbers
					Total 3 marks



14	(a)	Examples There are no members that are in both A and B No members in common (in A and B) No numbers the same (in A and B) B has even numbers. A has odd numbers except 2 which is not in B Nothing in A is in B or No overlap A and B don't share any numbers Nothing in the intersection of A and B	Correct statement	1	B1 for a statement which indicates correct meanings for intersection and empty set
	(b)		1 and 9	1	B1
	(c)	e.g. 	1, 2, 8, 9	2	B2 for fully correct (B1 for 3 or 4 correct with no more than one addition or a fully correct Venn diagram)
Total 4 marks					

20	(a)(i)		2, 3, 4, 6, 8, 9, 10, 12	1	B1
	(ii)		1, 2, 4, 5, 7, 8, 10, 11	1	B1
	(b)(i)		$\emptyset$	1	B1
	(ii)		ϵ	1	B1
Total 4 marks					

21	(a)		$-2 < x \leq 1$	2	B2 accept $1 \geq x > -2$ or $x > -2, x \leq 1$ if not B2 then B1 for $-2 < x$ or $x \leq 1$ or $-2 \leq x < 1$ or $-2 \leq x \leq 1$ or $-2 < x < 1$ Condone use of a variable other than x but not 0
	(b)	$7a - 3a \leq 28 + 5$ or $4a \leq 33$ or $-5 - 28 \leq 3a - 7a$ or $-33 \leq -4a$		2	M1 for a terms on one side and numbers on the other. Condone = rather than $\leq$ or any other sign for this mark.
		Working required	$a \leq 8.25$		A1 (dep on M1) oe eg $a \leq \frac{33}{4}$ or $a \leq 8\frac{1}{4}$ or $8.25 \geq a$ must have correct sign on answer line (sight of correct answer in working space and just 8.25 on answer line gains M1 only).
Total 4 marks					

Question	Working	Answer	Mark	Notes
10	$1.35 \div 3 (= 0.45)$ $[4.15 - (5 \times "0.45")] \div 2$	0.95	3	M1 M1 A1
				Total 3 marks
11 (a)		7.5	1	B1 oe $\frac{15}{2}, 7\frac{1}{2}$
(b) (i)		3.181(983516..)	2	M1 For 57.9121 or 18.2 oe A1
(ii)		3.2	1	B1ft ft as long as (i) has at least 3 sf.
				Total 4 marks
12 (a)(i)		2,3,4,6,7,8	1	B1 All numbers and no others, in any order
(ii)		3,4	1	B1 Both numbers and no others, in any order
(iii)		1,5,9,10	1	B1 All numbers and no others, in any order
(b)		$\frac{3}{10}$	2	M1 $\frac{3}{n}$ ($n > 3$) or $\frac{m}{10}$ ($m < 10$) A1 oe
				Total 5 marks

21	(a)(i)		9, 15	1	B1 no repeats
	(a)(ii)		9, 11, 12, 13, 15, 17, 18, 19	1	B1 no repeats or omissions
	(b)	No must be ticked along with a reason for the award of this mark	No with a correct reason	1	B1 No with eg 24/it is not in the universal set, 24/it is not between 9 and 20 (need some sort of reference that the numbers in the sets do not go beyond 20)
	(c)		10, 18 and two from 9, 11, 13, 15, 17, 19	2	B2 for 10, 18 and two from 9, 11, 13, 15, 17, 19 (B1 a set of 4 numbers of which 3 are correct or a set of 5 numbers including 10, 18, and no more than one incorrect number or a set of 3 or more numbers from {10, 18, 9, 11, 13, 15, 17, 19})
					Total 5 marks

22	(a)(i)		23, 24, 27, 29, 30, 31, 33	1	B1 in any order with no repeats
	(a)(ii)		27, 33	1	B1 in any order with no repeats
	(b)	eg 1. Yes, no members/numbers/values in common 2. Yes, nothing in common 3. Yes, no common members/numbers/values 4. Yes, they share no common members/numbers/values 5. Yes, there is not the same members/numbers/values in both sets 6. Yes, there is no intersection or there is nothing in B and C 7. Yes, as there are no members/numbers/values the same (in B and C) 8. Yes, no members/numbers/values in B are in C or vice versa 9. Yes, there are no members/numbers in B that are multiples of 3 10. Yes, there are no members/numbers/values in that empty set 11. Yes, 23, 29, 31 not in C 12. Yes, 24, 27, 30, 33 are not in B Allow sector for set This is not an exhaustive list Allow element(s) for members/numbers/values	Yes, there are no multiples of 3 in set B	1	B1 for Yes and a statement which indicates correct meanings of intersection and empty set. If no box is ticked, then the 'Yes' must be stated in the answer
	(c)		23, 25, 29, 31	2	B2 for the four correct numbers and no additions (B1 for three correct values with no more than one incorrect or for four correct values with no more than one incorrect)
Total 5 marks					

20	(a)(i)		1, 2, 3, 5, 6, 7	1	B1	in any order with no repeats
	(a)(ii)		4, 5, 7, 8, 9, 10	1	B1	in any order with no repeats
	(b)	eg 1. 2 (or 3 or 2 and 3) is in both sets oe 2. A and B have 2 (or 3 or 2 and 3) oe 3. 2 (or 3 or 2 and 3) is common oe 4. 2 (or 3 or 2 and 3) is in the intersection oe 5. $A \cap B = \{2, 3\}$ oe or $A \cap B = \{2\}$ oe or $A \cap B = \{3\}$ oe 6. They share 2 (or 3 or 2 and 3) oe 7. As 2 and/or 3 are factors of 6 and also prime numbers oe Allow sector for set This is not an exhaustive list	2 (or 3 or 2 and 3) is a member of A and B	1	B1	for identifying the element 2 or 3 or 2 and 3 with a correct explanation to show they know the meaning of intersection and empty set If students mention a number that is common, it must be correct
	(c)		1, 5, 6, 7	2	B2	for 1, 5, 6, 7 (B1 for three correct values with no more than one incorrect or for four correct values with no more than one incorrect)
						Total 5 marks