Please check the examination details below before entering your candidate information

Candidate surname	Other names

Centre Number | Candidate Number

Pearson Edexcel Level 1/Level 2 GCSE (9–1)

Thursday 16 May 2024

Morning (Time: 1 hour 30 minutes)

Paper reference **1MA1/1F**

Mathematics

PAPER 1 (Non-Calculator)

Foundation Tier

You must have: Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB or B pencil, eraser, Formulae Sheet (enclosed). Tracing paper may be used.

Total Marks

Instructions

- Use **black** ink or ball-point pen.
- If pencil is used for diagrams/sketches/graphs it must be dark (HB or B).
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided
  – *there may be more space than you need.*
- You must **show all your working**.
- Diagrams are **NOT** accurately drawn, unless otherwise indicated.
- **Calculators may not be used**.

Information

- The total mark for this paper is 80
- The marks for **each** question are shown in brackets
  – *use this as a guide as to how much time to spend on each question.*

Advice

- Read each question carefully before you start to answer it.
- Try to answer every question.
- Check your answers if you have time at the end.

Turn over ▶

P76922A

Pearson

Please note that these worked solutions have neither been provided nor approved by Pearson Education and may not necessarily constitute the only possible solutions. Please refer to the original mark schemes for full guidance.

Any writing in blue should be written in the exam.

Anything written in green in a rectangle doesn't have to be written in the exam.

If you find any mistakes or have any requests or suggestions, please send an email to curtis@cgmaths.co.uk

Answer ALL questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

1 Write the number 18 475 correct to the nearest thousand.

The 8 is in the thousands place. The 4 after this causes it to round down so the 8 stays the same and everything after it is set to 0

18000

(Total for Question 1 is 1 mark)

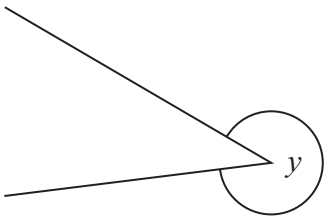
2 Write 0.3 as a percentage.

To convert a decimal to a percentage it can be multiplied by 100.
0.3 × 100 = 30, which could be done by moving the decimal point twice to the right

30 %

(Total for Question 2 is 1 mark)

3 Write down the mathematical name for the type of angle marked y.



It is more than 180°

Reflex

(Total for Question 3 is 1 mark)

4 Write these numbers in order of size.
Start with the smallest number.

0.21 0.20 0.03 0.10 0.16

Writing all the numbers to 2 decimal places by adding 0s makes them easier to compare

0.03, 0.1, 0.16, 0.2, 0.21

(Total for Question 4 is 1 mark)

5 Find the square root of 64

$8^2 = 8 \times 8 = 64$, so the square root of 64 is 8

8

(Total for Question 5 is 1 mark)

6 Ryan buys

4 cakes at £1.30 each
2 identical tins of soup.

Ryan pays with a £10 note.
He gets £1.80 change.

How much does Ryan pay for each tin of soup?

$$\begin{array}{r} {}^{0}\cancel{1}{}^{9}\,{}^{1}\cancel{0}.0\,0 \\ -\ 1.8\,0 \\ \hline 8.2\,0 \end{array}$$

Subtracting the £1.80 change from the £10 paid works out that the total cost is £8.20

$$\begin{array}{r} 1.3\,0 \\ \times\quad 4 \\ \hline {}^{1}5.2\,0 \end{array}$$

Multiplying the cost of a cake by 4 works out that the cost of 4 cakes is £5.20

$$\begin{array}{r} 8.2\,0 \\ -\ 5.2\,0 \\ \hline 3.0\,0 \end{array}$$

Subtracting the cost of the 4 cakes from the total cost works out that the 2 tins of soup costs £3

$$2\overline{)3.{}^{1}0\,0} \quad 1.5\,0$$

Dividing the cost of 2 tins of soup by 2 works out the cost of 1 tin of soup

£ 1.50

(Total for Question 6 is 4 marks)

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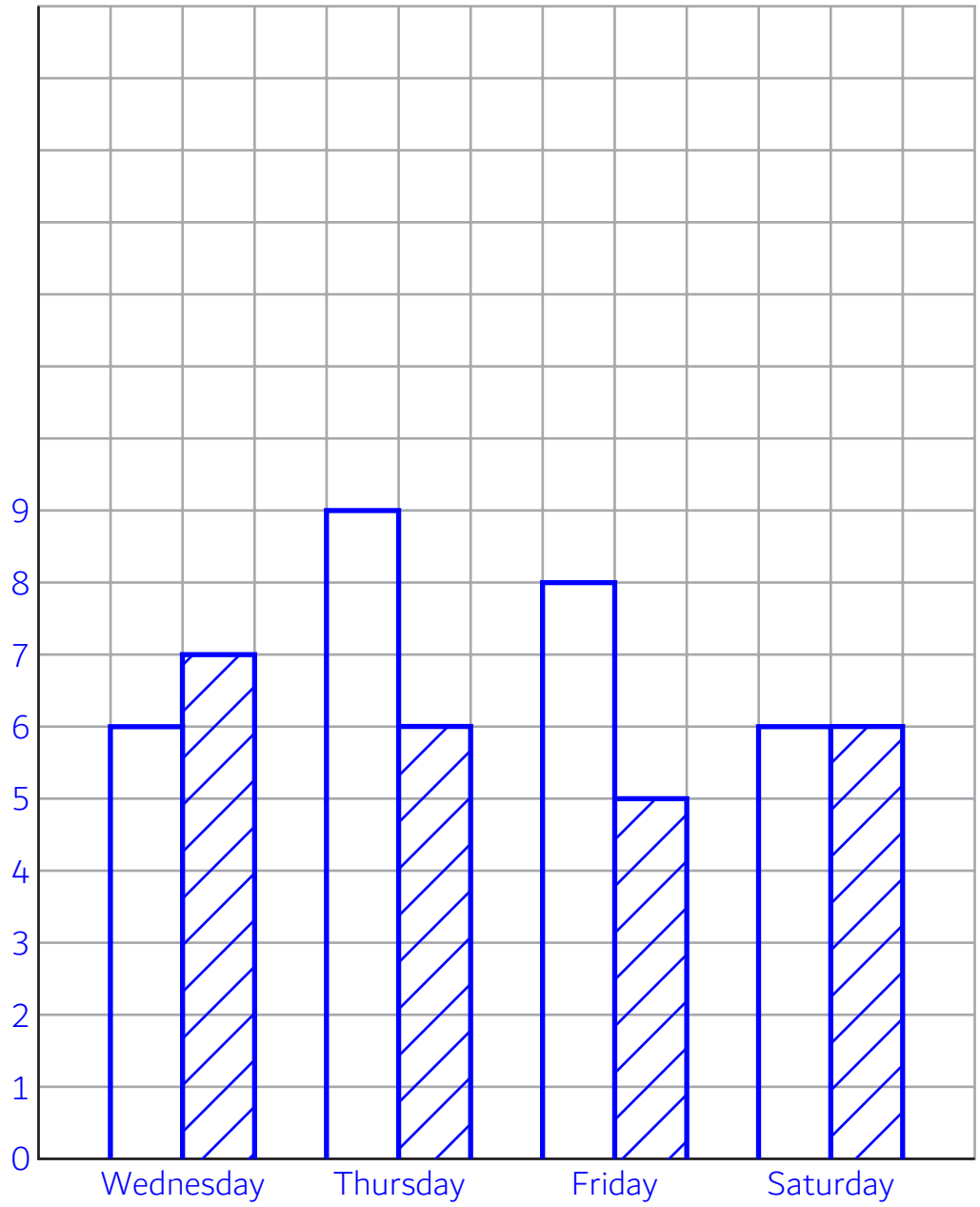
7 The table shows the number of hours that Lena and Pavel worked on each of four days last week.

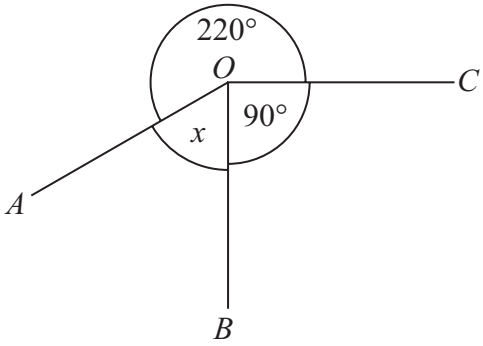
	Wednesday	Thursday	Friday	Saturday
Lena	6	9	8	6
Pavel	7	6	5	6

On the grid, draw a suitable diagram or chart for this information.



(Total for Question 7 is 4 marks)

8 *OA*, *OB* and *OC* are three straight lines.



(i) Work out the size of the angle marked *x*.

220
+ 90 ← Adding the known angles around point O works out that there are 310° so far
310
1

360
-310 ← There are 360° in total around a point so subtracting the known angles from 360° leaves angle *x*
50

50 °

(2)

(ii) Give a reason for your answer.

There are 360° around a point

(1)

(Total for Question 8 is 3 marks)

9 Here is a number machine.

(a) Work out the output when the input is 13

13
× 2
26
- 10
16

Taking the input then multiplying it by 2. Then subtracting 10 from the result. This gives the output

16

(1)

(b) Work out the input when the output is 28

28
+10
38

Doing the opposite operations in the opposite order to go from the output to the input. First adding 10 to the output

19
2|3¹8

Then dividing the result by 2 to get the input

19

(2)

(c) Show that there is a number for which the output is the same as the input.

10 × 2
20 - 10 = 10

Multiplying 10 by 2 increases it by 10, which will be undone by the subtraction of 10. So an input of 10 will give an output of 10

(2)

(Total for Question 9 is 5 marks)

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10 There are 24 cows and 36 sheep on a farm.

Write as a ratio the number of cows to the number of sheep.
Give your ratio in its simplest form.

24 : 36 ← Writing the ratio

The ratio is simplified by dividing both sides by 12 → 2 : 3

(Total for Question 10 is 2 marks)

11 (a) Work out $-12 \div -4$

12 ÷ 4 = 3 so -12 ÷ -4 = 3 as the negatives cancel out

3

(1)

(b) Find the value of 2^5

2, 4, 8, 16, 32 ← Listing out the powers of 2 by starting with 2 and keep doubling. The 5th number in the list is 2^5

32

(1)

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

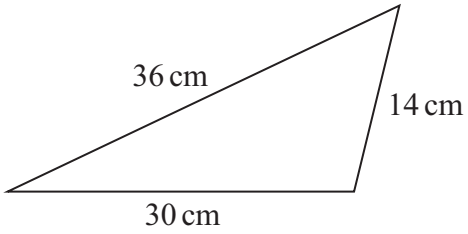
$$30 \div 3 + 2 - 4 = 2$$

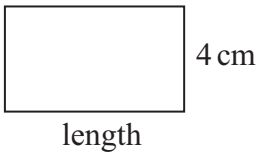
The order of operations, BIDMAS, must be followed. So what is inside the brackets will be done first. 3 + 2 = 5, then 30 ÷ 5 = 6, then 6 - 4 = 2

(1)

(Total for Question 11 is 3 marks)

12 The diagram shows a triangle and a rectangle.





The perimeter of the rectangle is a quarter of the perimeter of the triangle.

Work out the length of the rectangle.

36
+ 30
+ 14
80
1

← Adding all of the outside sides of the triangle works out that its perimeter is 80 cm

2 0
4 | 8 0

← Dividing the perimeter of the triangle by 4 works out that a quarter of the perimeter of the triangle is 10 cm. This is the perimeter of the rectangle

4 + 4 ← Opposite sides of a rectangle are equal so adding two lots of the 4 cm works out that there is 8 cm known on the perimeter of the rectangle

20 - 8 ← Subtracting the 8 cm known from the perimeter of the rectangle works out that 12 cm is left on the perimeter, which must be made by two lots of the length

12 ÷ 2 ← Dividing the remaining 12 cm by the 2 lengths work out that the length of the rectangle is 6 cm

6 cm

(Total for Question 12 is 4 marks)

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13 There are only £10 notes and £20 notes in a wallet.

Ali takes at random a note from the wallet.

(a) Write down the probability that Ali takes a note with a value of more than £5

It is certain and the probability of an event which is certain is 1

1

(1)

There are only 1p coins and 2p coins in a bag.
The total value of the coins in the bag is 40p

The total value of the 1p coins is the same as the total value of the 2p coins.

Simon takes at random a coin from the bag.

(b) Find the probability that Simon takes a 1p coin.

2 : 1 ← There must be twice as many 1p coins as 2p coins as the total value of both types of coin is the same but 1p is half of 2p. Writing the number of 1p coins to the number of 2p coins as a ratio

2 + 1 = 3 parts in total in the ratio. 2 out of these 3 parts are representing the 1p coins → $\frac{2}{3}$

(2)

(Total for Question 13 is 3 marks)

14 Work out 273×54

$$\begin{array}{r} 273 \\ \times\ 54 \\ \hline 1092 \\ 13650 \\ \hline 14742 \end{array}$$

14742

(Total for Question 14 is 3 marks)

15 Tessa recorded the times that 15 adults took to complete a run.
She showed her results in a stem and leaf diagram.

4	5 9
5	3 7 8
6	1 2 4 5 7 7
7	2 6 7
8	1

Key:

4 | 5 represents 45 minutes

(a) Find the median.

The data is already in order so underlining from each end until the time in the middle is found

64 minutes

(1)

(b) Find the range.

$$\begin{array}{r} {}^{7}\not{8}{}^{1}1 \\ -\ 4\ 5 \\ \hline 3\ 6 \end{array}$$

Range = largest - smallest. The largest time is 81 minutes and the smallest time is 45 minutes

36 minutes

(2)

Tessa also recorded the times that 15 children took to complete the run.

For the children, the median was 75 minutes.

(c) Compare the times that the adults took with the times that the children took.

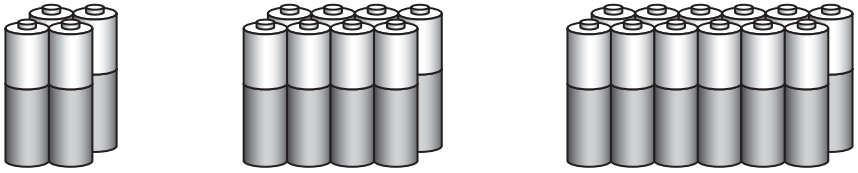
Children had a greater median

The median of 75 for the children is greater than the median of 64 for the adults

(1)

(Total for Question 15 is 4 marks)

16 Batteries are sold in packs of 4, in packs of 8 and in packs of 12



£1.80 £3.20 £6.00

A pack of 4 batteries costs £1.80
A pack of 8 batteries costs £3.20
A pack of 12 batteries costs £6.00

Which pack gives the best value for money?
You must show how you get your answer.

$$4\overline{)1^{1}8^{2}0}\ =\ 0\,4\,5$$

£1.80 is 180p. Dividing the cost of a pack of 4 by the 4 batteries works out that 1 battery would cost 45p when bought in a pack of 4

$$8\overline{)3^{3}2\,0}\ =\ 0\,4\,0$$

£3.20 is 320p. Dividing the cost of a pack of 8 by the 8 batteries works out that 1 battery would cost 40p when bought in a pack of 8

$$12\overline{)6^{6}0\,0}\ =\ 0\,5\,0$$

£6.00 is 600p. Dividing the cost of a pack of 12 by the 12 batteries works out that 1 battery would cost 50p when bought in a pack of 12

Pack of 8

40p is the cheapest cost of 1 battery so the pack of 8 is best value for money

(Total for Question 16 is 3 marks)

17 Solve $2(4x - 5) = 18$

$4x - 5 = 9$ ← Dividing both sides by 2 eliminates the 2 on the left. The brackets are no longer needed

$4x = 14$ ← Adding 5 to both sides eliminates the -5 on the left and gets the x term on its own

Dividing both sides by 4 eliminates the 4 on the left and gets x on its own. As 14 cannot be divided by 4 to give a whole number it can be left as a fraction which does not need to be simplified → $\frac{14}{4}$

$x =$ .....

(Total for Question 17 is 3 marks)

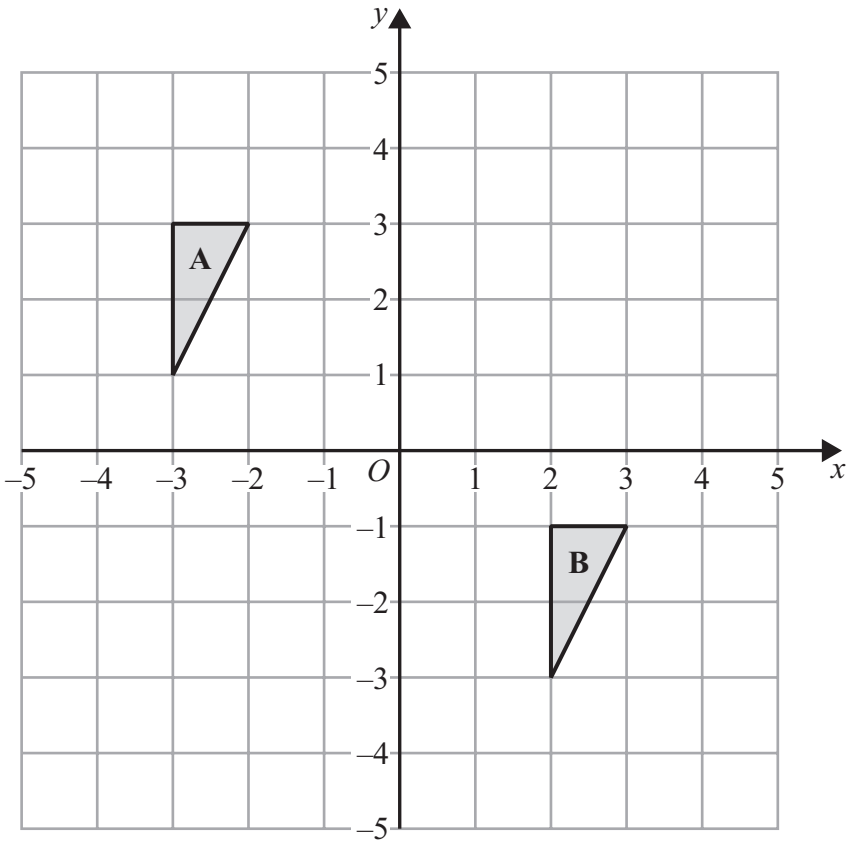
18 Write down the value of 10^0

Anything to the power of 0 is 1 → 1

.....

(Total for Question 18 is 1 mark)

19



Describe fully the **single** transformation that maps triangle **A** onto triangle **B**.

Translation $\begin{pmatrix} 5 \\ -4 \end{pmatrix}$

A moves 5 to the left and 4 down to get to B. This is 5 in the x-direction and -4 in the y-direction

(Total for Question 19 is 2 marks)

20 Here are the first four terms of an arithmetic sequence.

1 5 9 13

Find an expression, in terms of n, for the nth term of this sequence.

The sequence increases by 4 between each term so the expression must involve $4n$. Going back in the sequence finds that the 0th term (the one before the first term) would be -3. So the expression for the nth term is $4n - 3$

$4n - 3$

(Total for Question 20 is 2 marks)

21 (a) Work out $3\frac{4}{5} - 1\frac{2}{3}$

$3\frac{12}{15} - 1\frac{10}{15}$ ← Converting the 4/5 and 2/3 so that they have the same denominator. Multiplying both the numerator and denominator of 4/5 by 3 and multiplying both the numerator and denominator of 2/3 by 5

The 3 subtract the 1 gives 2 as the whole number. The 12 subtract the 10 gives 2 as the numerator. The denominator of 15 stays the same → $2\frac{2}{15}$

(2)

Kevin was asked to work out $2\frac{1}{3} \times \frac{5}{8}$

Here is his working and his answer.

$$2\frac{1}{3} \times \frac{5}{8} = \frac{7}{3} \times \frac{5}{8}$$

$$= \frac{35}{24}$$

$$= 1\frac{9}{24}$$

Kevin's answer is wrong.

(b) What mistake has Kevin made?

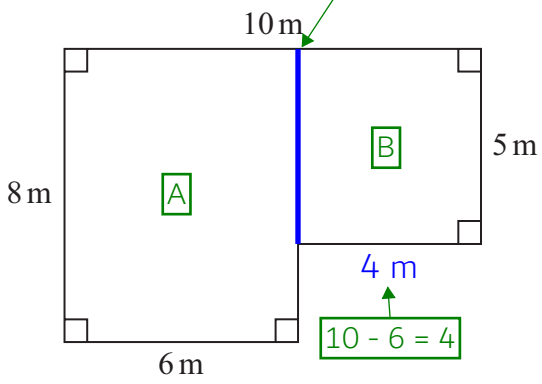
Should be $1\frac{11}{24}$ ← 35/24 was correct but it was not converted into a mixed number correctly

(1)

(Total for Question 21 is 3 marks)

22 The diagram shows a plan of a floor.

Splitting the shape into two rectangles



10 - 6 = 4

Petra is going to cover the floor with paint.

Petra has 3 tins of paint.
There are 2.5 litres of paint in each tin.

Petra thinks 1 litre of paint will cover 10 m^2 of floor.

(a) Assuming Petra is correct, does she have enough paint to cover the floor?
You must show all your working.

$8 \times 6 = 48$ ← Area of rectangle = length × width. So the area of rectangle A is 48 m^2

$5 \times 4 = 20$ ← Area of rectangle = length × width. So the area of rectangle B is 20 m^2

$48 + 20 = 68$ ← Adding the areas of both rectangles works out that the total area of the floor is 68 m^2

$$\begin{array}{r} 2.5 \\ \times\ 3 \\ \hline 7.5 \end{array}$$ ← Multiplying the 2.5 litres of paint in each tin by the 3 tins works out that there is 7.5 litres in total

$7.5 \times 10 = 75$ ← Multiplying the 7.5 litres of paint by the 10 m^2 which each litre covers works out that the paint can cover 75 m^2

Yes ← Petra does have enough paint as the 75 m^2 which can be covered is more than the 68 m^2 which needs to be covered

(4)

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Actually, 1 litre of paint will cover 11 m^2 of floor.

(b) Does this affect your answer to part (a)?
You must give a reason for your answer.

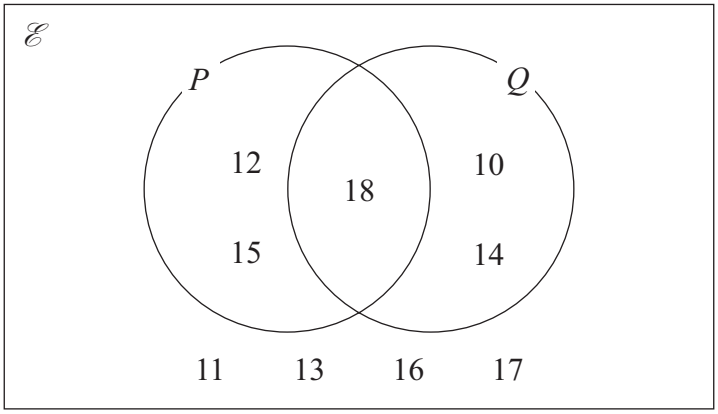
No, more area could be covered

The 7.5 litres would be multiplied by 11 m^2, which will give a greater result than the 75 m^2 which could be covered before. If more can be covered, this does not affect the answer to part (a) as only 68 m^2 needs to be covered so there will still be enough paint

(1)

(Total for Question 22 is 5 marks)

23 Here is a Venn diagram.



(a) Write down the numbers that are in set P'

The numbers not in P → 10, 14, 11, 13, 16, 17

(1)

A number is chosen at random from the universal set, $\mathscr{E}$

(b) Find the probability that this number is in the set $P \cup Q$

P ∪ Q is the union of P and Q, which is all numbers which are in P or Q or both. This is the numbers 12, 15, 18, 10, 14. This is 5 out of the 9 numbers → $\frac{5}{9}$

(2)

(Total for Question 23 is 3 marks)

24 Sophie drives a distance of 513 kilometres on a motorway in France.
She pays 0.81 euros for every 10 kilometres she drives.

(a) Work out an estimate for the total amount that Sophie pays.

500 ÷ 10 ← 513 kilometres is rounded to 500 kilometres. Dividing this by 10 works out that roughly 50 lots of 10 kilometres were travelled

50 × 0.80 ← 0.81 euros is rounded to 0.80 euros. Multiplying the 50 lots by 0.80 euros estimates the total amount Sophie pays

5 × 8 = 40, so 50 × 8 = 400, so 50 × 0.80 = 40 → 40 euros

(3)

(b) Is your answer to part (a) an underestimate or an overestimate?
Give a reason for your answer.

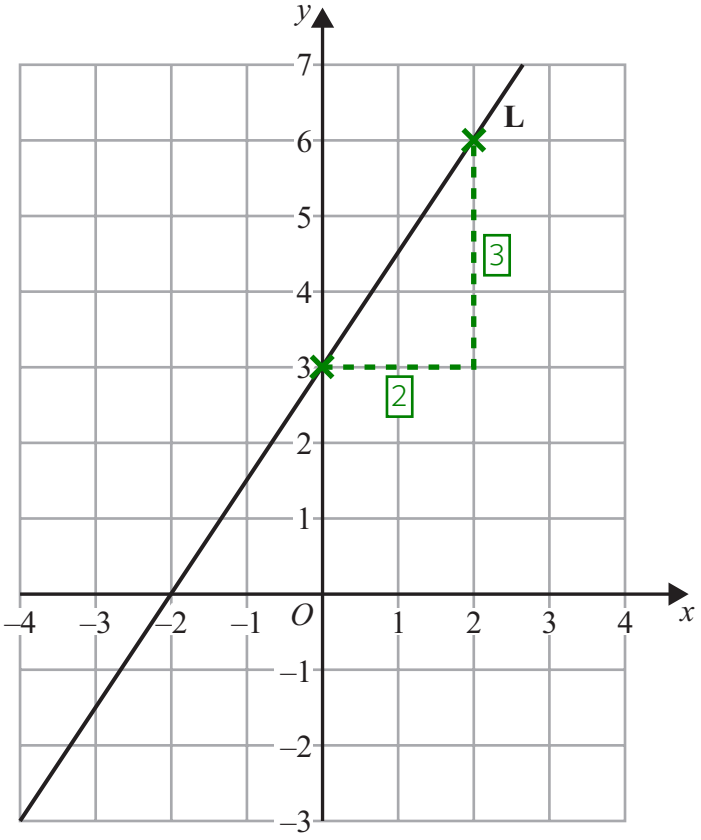
Underestimate, as the values were rounded down

Both the 513 kilometres and the 0.81 euros were rounded down. As these are multiplied together, this means that the answer of 40 euros is too low

(1)

(Total for Question 24 is 4 marks)

25 Here is a straight line **L** drawn on a grid.



(a) Find an equation for **L**.

The general equation of a straight line is $y = mx + c$, where m is the gradient and c is the y-intercept. Gradient = (change in y)/(change in x). y changes by 3 and x changes by 2 between the two green crosses on the graph. So the gradient is 3/2. The y-intercept is 3 as this is the y-coordinate where it crosses the y-axis

$y = \frac{3}{2}x + 3$

(3)

M is a different straight line with equation $y = 5x$

(b) Write down the equation of a straight line parallel to **M**.

The general equation of a straight line is $y = mx + c$, where m is the gradient and c is the y-intercept. The gradient of $y = 5x$ is 5. Parallel lines have the same gradient but different y-intercept so writing an equation with a gradient of 5 and a y-intercept of 1 (this could be any value apart from 0)

$y = 5x + 1$

(1)

(Total for Question 25 is 4 marks)

26 Kasim has some small jars, some medium jars and some large jars.
He has a total of 400 jars.

$\frac{3}{8}$ of the 400 jars are empty.

For the empty jars,

number of small jars : number of medium jars = 3 : 4
number of medium jars : number of large jars = 1 : 2

Work out the percentage of Kasim's jars that are empty small jars.

400 ÷ 8 ← This works out that 1/8 of the 400 jars is 50

50 × 3 = 150 ← This works out that 3/8 of the 400 jars is 150 empty jars

S : M : L
3 4
1 2
3 4 8

← Writing the ratios above each other in columns. Multiplying both sides of the 1 : 2 ratio by 4 makes it 4 : 8, which can now be combined with the 3 : 4 ratio as they both have the same number of parts for medium. So the ratio small : medium : large = 3 : 4 : 8

$\frac{3}{15} = \frac{1}{5}$ ← 3 + 4 + 8 = 15 parts in total in the ratio. 3 out of these 15 parts represent the empty small jars. Writing this as a fraction then simplifying by dividing both the numerator and denominator by 3

150 ÷ 5 ← Doing 1/5 of the 150 empty jars works out that there are 30 empty small jars

$\frac{30}{400} \times 100$ ← 30 out of the 400 jars are empty small jars. Expressing this as a fraction of the total 400 jars. Multiplying this by 100 converts it into a percentage

30 × 100 = 3000. The answer can be left as a fraction which does not need to be simplified → $\frac{3000}{400}$

..... %

(Total for Question 26 is 5 marks)

27 In a sale, normal prices are reduced by 30%

The sale price of a TV is £280

Work out the normal price of the TV.

100 - 30 ← Subtracting the 30% from 100% works out that the price of the TV had reduced to 70% of the original

280 ÷ 70 ← Dividing the £280 by 70 works out that 1% of the normal price is £4. An equivalent division is 28 ÷ 7

4 × 100 ← Multiplying the value of 1% by 100 works out that 100% of the normal price is £400

£ 400

(Total for Question 27 is 2 marks)

28 Solve $x + 11 \leqslant 5 - \frac{1}{2}x$

$\frac{2}{2} + \frac{1}{2}$ ← Working out that 1 + 1/2 = 3/2

$\frac{3}{2}x + 11 \leq 5$ ← Adding 1/2 x to both sides

$\frac{3}{2}x \leq -6$ ← Subtracting 11 from both sides

$3x \leq -12$ ← Multiplying both sides by 2

Dividing both sides by 3 → $x \leq -4$

(Total for Question 28 is 3 marks)

TOTAL FOR PAPER IS 80 MARKS

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