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Pearson Edexcel Level 1/Level 2 GCSE (9–1)	Centre Number	Candidate Number
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Tuesday 21 May 2019

Morning (Time: 1 hour 30 minutes)	Paper Reference 1MA1/1F
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Mathematics Shadow Paper B

Paper 1 (Non-Calculator)

Foundation Tier

You must have: Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser.
Tracing paper may be used.

Total Marks

Instructions

- Use **black** ink or ball-point pen.
- **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.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end.

Turn over ►

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Answer ALL questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

1 Write 420 minutes in hours.

$$60 \overline{) 420} \begin{array}{r} 7 \\ \end{array}$$

..... 7 hours

(Total for Question 1 is 1 mark)

2 Write 0.59 as a percentage.

..... 59% %

(Total for Question 2 is 1 mark)

3 Work out $10 \times (5 + 4)$

$$5 + 4 = 9$$
$$9 \times 10 = 90$$

..... 90

(Total for Question 3 is 1 mark)

4 Write down a prime number that is between 60 and 70

~~60~~ 61 ~~62~~ 63 ~~64~~ 65 ~~66~~ 67 ~~68~~ 69 70 Cross out even numbers

61 63 ~~65~~ 67 69 Cross out numbers with 5 or 0.

61, ~~63~~, ~~67~~, ~~69~~ Cross out number whose unit digit sum adds to 3, 6 or 9. 61 or 67

61 or 67

(Total for Question 4 is 1 mark)

~~60~~ $61 \div 6 = 10 \text{ r } 1$
 $67 \div 6 = 11 \text{ r } 1$ } where numbers have a remainder of 1 or 5 when divided by 6 gives the possibility of prime.



- 5 Find the number that is exactly halfway between 83 and 151

$$\frac{83 + 151}{2} = \frac{234}{2} = 117$$

117

(Total for Question 5 is 1 mark)

- 6 Harry is planning a holiday for 5 people for 9 days.

Here are the costs for the holiday for each person.

Travel	£235
Hotel	£85 for each day
Spending money	£275

Work out the total cost of the holiday for 5 people for 9 days.

Hotel

$$85 \times 5 \times 9 = 85 \times 45 \\ = 3825$$

$$\begin{array}{r} 85 \times \\ 45 \\ \hline 425 \\ 3400 \\ \hline 3825 \end{array}$$

Remember the zero!

Travel

$$235 \times 5 = 1175$$

Spending money

$$275 \times 5 = 1375$$

$$\begin{array}{r} 235 \quad 275 \\ 5 \times \quad 5 \times \\ \hline 1175 \quad 1375 \end{array}$$

Total cost

$$\begin{array}{r} 3825 \\ 1175 + \\ 1375 \\ \hline 6375 \end{array}$$

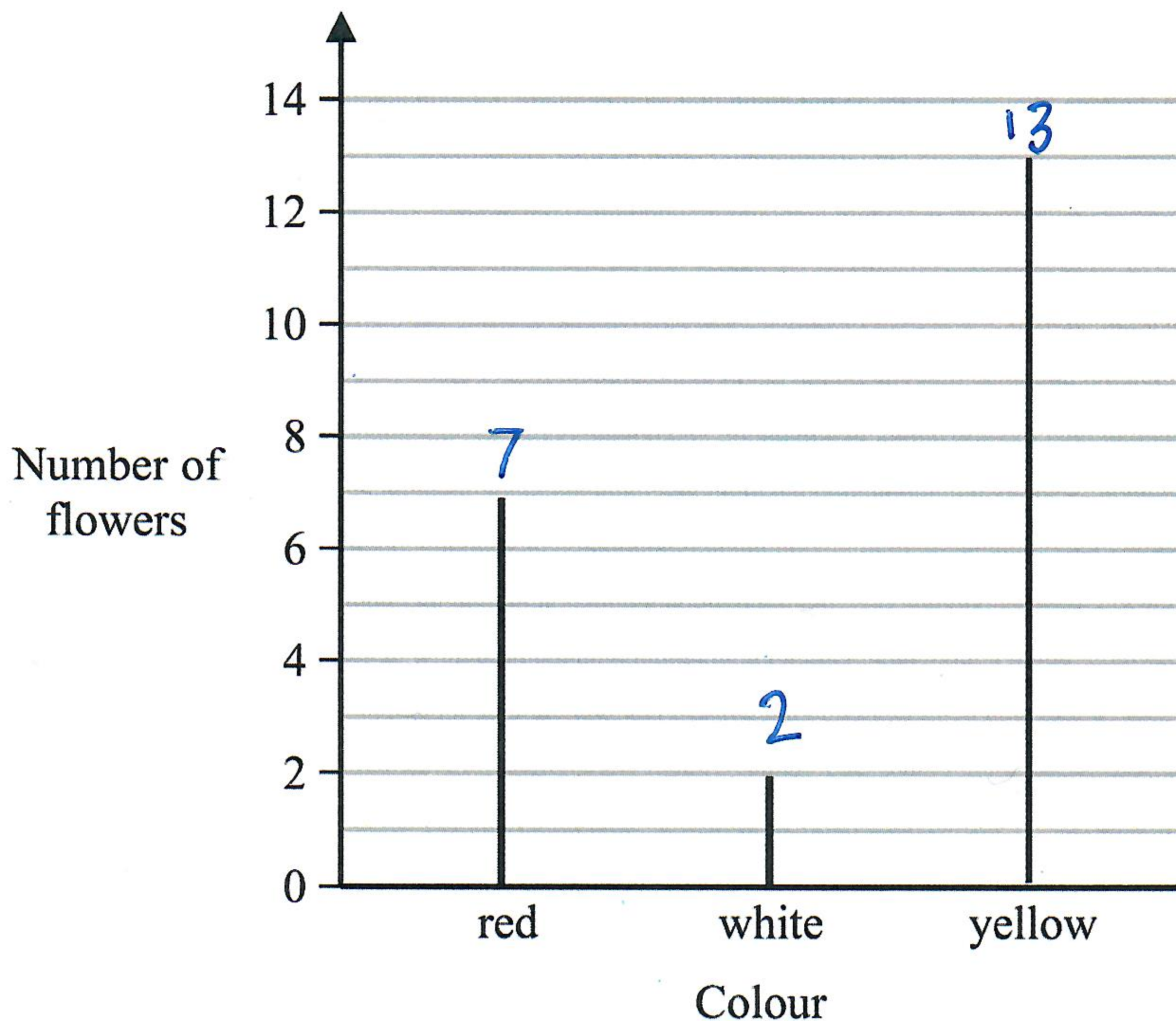
£ 6375.00

(Total for Question 6 is 4 marks)



7 In Adam's garden, the flowers are only red or white or yellow or blue.

The chart shows the number of red flowers, the number of white flowers and the number of yellow flowers.



The total number of flowers is 30

(a) Work out the number of blue flowers.

$$30 - (7 + 2 + 13) = 30 - 22 = 8 \text{ blue flowers}$$

8

(2)

(b) Write down the mode.

Yellow has the most flowers so:

Yellow

(1)

(Total for Question 7 is 3 marks)



- 8 Write the following fractions in order of size.
Start with the smallest fraction.

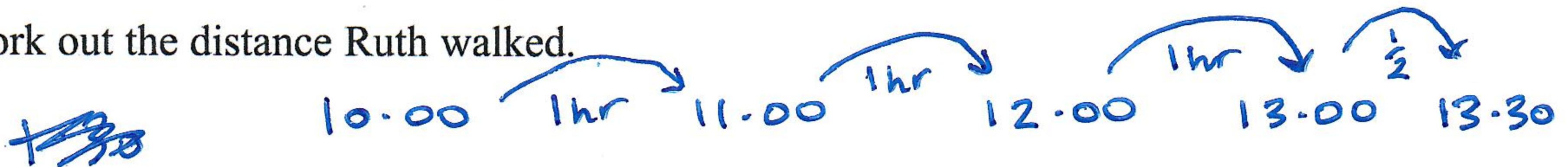
$$\begin{array}{cccccc} \frac{3}{5} & \frac{3}{4} & \frac{1}{2} & \frac{9}{10} & \frac{1}{3} & \frac{17}{20} \\ 0.6 & 0.75 & 0.5 & 0.9 & 0.\dot{3} & 0.85 \\ \checkmark & \checkmark & \checkmark & \checkmark & \checkmark & \checkmark \end{array}$$

$$\frac{1}{3} \quad \frac{1}{2} \quad \frac{3}{5} \quad \frac{3}{4} \quad \frac{17}{20} \quad \frac{9}{10}$$

(Total for Question 8 is 2 marks)

- 9 Ruth left her home at 10 am and walked to the library.
She got to the library at 1:30 pm. Ruth
walked at a speed of 2 mph.

- (a) Work out the distance Ruth walked.



Ruth walked for $3\frac{1}{2}$ hours. ①

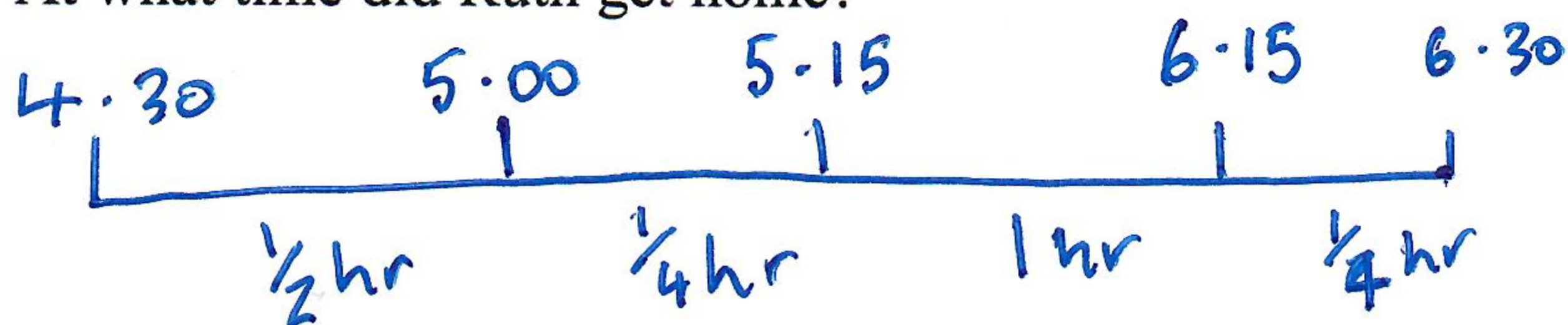
$$3\frac{1}{2} \times 2 = 7 \text{ miles} \quad \textcircled{2}$$

..... 7 miles
(2)

Ruth got to the library at 4:30 pm.
She stayed at the library for 45
minutes. Then she walked home.

Ruth took $1\frac{1}{4}$ hours to walk home.

- (b) At what time did Ruth get home?



..... 6:30 pm

(2)

(Total for Question 9 is 4 marks)



10 (a) Solve $t + t + t + t = 28$

$$\begin{aligned} &\div 4 \quad \left\{ \begin{array}{l} 4t = 28 \\ t = \frac{28}{4} = 7 \end{array} \right. \div 4 \end{aligned}$$

$$t = \frac{7}{(1)}$$

(b) Solve $x - 11 = 9$

$$\begin{aligned} &+11 \quad \left\{ \begin{array}{l} x - 11 = 9 \\ x = 20 \end{array} \right. +11 \end{aligned}$$

$$x = \frac{20}{(1)}$$

(c) Solve $5w + 7 = 52$

$$\begin{aligned} &-7 \quad \left\{ \begin{array}{l} 5w + 7 = 52 \\ 5w = 45 \\ \div 5 \quad \left\{ \begin{array}{l} w = 9 \end{array} \right. \end{array} \right. -7 \end{aligned}$$

$$w = \frac{9}{(2)}$$

(Total for Question 10 is 4 marks)

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11 Work out 27×38

$$\begin{array}{r} 27 \\ 38 \times \\ \hline 216 \\ 820 \leftarrow \text{Remember the zero} \\ \hline 1026 \end{array}$$

1026

(Total for Question 11 is 2 marks)

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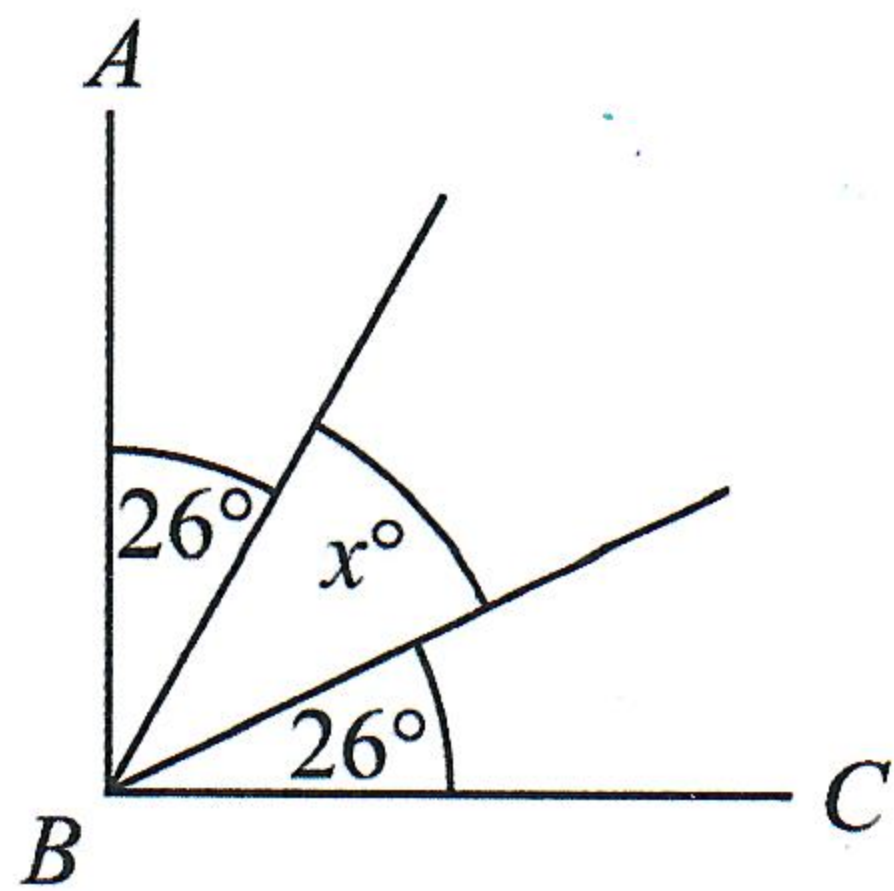
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12 AB and BC are perpendicular lines.

means 90°
 "at right angles to"

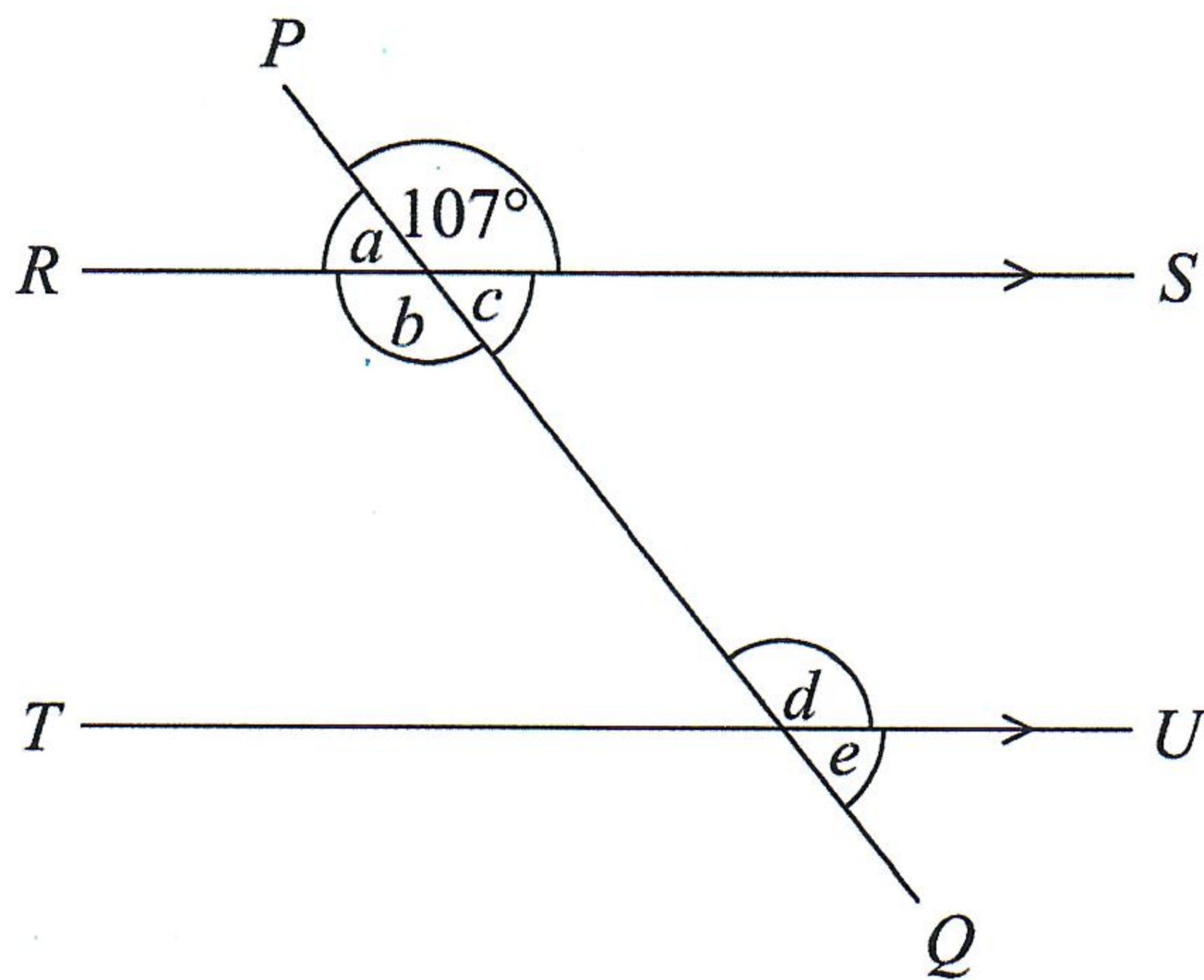


(a) Find the value of x .

$$90 - (26 + 26) = 90 - 52 = 38$$

$x =$ 38
 (2)

RS and TU are parallel lines.
 PQ is a straight line.



An angle of size 107° is shown on the diagram.

(b) (i) Write down the letter of one other angle of size 107°
 Give a reason for your answer.

$b = 107^\circ$ vertically opposite — must have the reason
 $d = 107^\circ$ corresponding — to get a mark.
 (2)

(ii) Explain why $a + b + c = 253^\circ$

$a + b + c + 107 = 360$; (Angles about a point sum
 to 360°)
 $\swarrow -107$ $\searrow -107$
 $a + b + c = 253^\circ$
 (1)

(Total for Question 12 is 5 marks)



13 The length of a line is $3x$ centimetres.

Write down an expression, in terms of x , for the length of the line in millimetres.

There are 10 mm in 1 cm so $3x \times 10 = 30x$

$30x$

(Total for Question 13 is 1 mark)

14 (a) Work out $\frac{1}{5}$ of 160

$$\frac{1}{5} \times \frac{160}{1} = 16 \times 2 = 32$$

$$\div 5 = \div 10 \text{ then } \times 2$$

32

Fiona had to work out $86 \div \frac{3}{4} =$

(1)

$$86 \div \frac{3}{4} = 63\frac{1}{2}$$

Fiona's reason is that 86 divided by 4 is 21.5 and then

multiply it by 3 gives you 63.5. Is Fiona correct?

~~Yes she is~~

No she isn't. She multiplied by $\frac{3}{4}$. She needed to multiply by $\frac{4}{3}$ so the answer is

(1)

(Total for Question 14 is 2 marks)

$$\frac{86}{3} = 28\frac{2}{3}$$

$$28\frac{2}{3} \times 4 = 114\frac{2}{3}$$

$$20 \times 4 = 80$$

$$8 \times 4 = 32$$

$$\frac{2}{3} \times 4 = \frac{8}{3} = 2\frac{2}{3}$$

$$80 + 32 + 2\frac{2}{3} = 114\frac{2}{3}$$



15 (a) Write down the value of $\sqrt{121}$

11

(1)

(b) Work out the value of 3^3

$$\begin{aligned} & 3 \times 3 \times 3 \\ & \underbrace{\quad\quad\quad} \\ & = 9 \times 3 \\ & = 27 \end{aligned}$$

27

(1)

(Total for Question 15 is 2 marks)

16 (a) Expand $3(9m - 5)$

$$\begin{array}{r|l} 9m & -5 \\ \hline 3 & 27m \quad -15 \end{array}$$

27m - 15

(1)

(b) Factorise $12n + 60$

$$\begin{aligned} & 3 \times 2 \times 2 \times n \\ & 3 \times 2 \times 2 \times 5 \end{aligned}$$

12(n + 5)

(1)

(Total for Question 16 is 2 marks)

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17 Stuart throws a biased coin 20 times.
He gets 9 Tails.

Michael throws the same coin 100
times. ~~She~~ He gets 41 Tails.

Prasha is going to throw the coin once.

- (i) Whose results will give the better estimate for the probability that she will get Tails, Stuart's or Michael's?

You must give a reason for your answer.

Michael's because he has thrown the dice
more times

(1)

- (ii) Use Stuart's and Michael's results to work out an estimate for the probability that Prasha will get Tails.

$$\frac{9 + 41}{20 + 100} = \frac{50}{120} = \frac{5}{12}$$

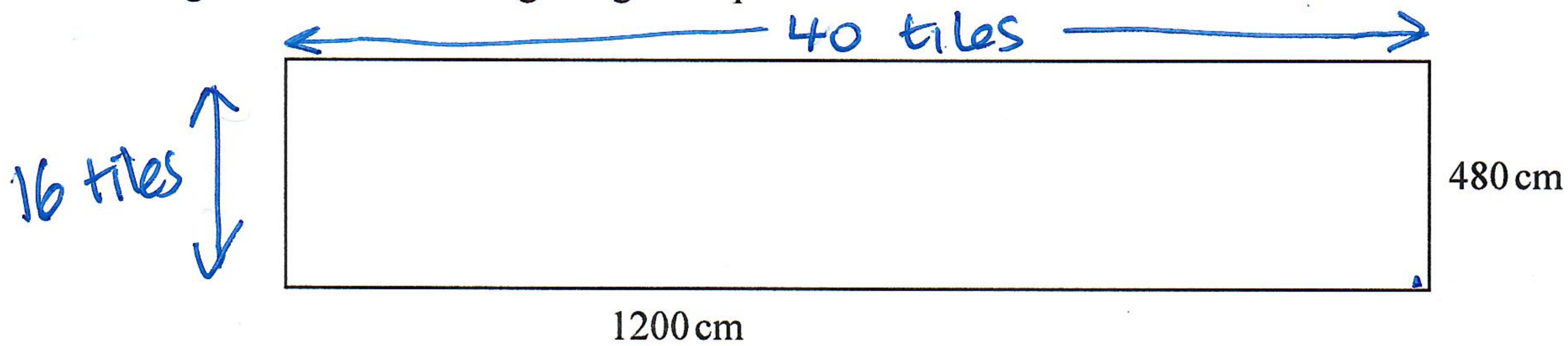
$$\frac{5}{12}$$

(1)

(Total for Question 17 is 2 marks)



18 The diagram shows a rectangular garden path.



Janette is going to cover the path with paving stones.
 Each paving stone is a square of side 30 cm.
 Each paving stone costs £2.60

Janette has £1660 to spend on paving stones.

Does Janette have enough money to buy all the paving stones she needs?

$$30 \overline{) 1200}^{40} \qquad 30 \overline{) 480}^{16}$$

No. of ~~tiles~~ ^{stones} = 40×16
 $= 640$

Cost of paving stones

$$640 \times 2.60$$

$$= \pounds 1664.$$

$$\begin{array}{r} 640 \\ \times 2.60 \\ \hline 0 \\ 38400 \\ 128000 \\ \hline 1664.00 \end{array}$$

Remember zeros

So: No, Janette cannot afford the paving stones because $1664 > 1660$.

Two digits behind the point in the question means 2 digits behind the point in the answer.

(Total for Question 18 is 4 marks)



19 (a) Work out $\frac{2}{3} - \frac{4}{9}$

$$\frac{(2 \times 9) - (3 \times 4)}{(3 \times 9)} = \frac{18 - 12}{27} = \frac{6}{27} = \frac{2}{9}$$

$$\frac{2}{9}$$

(2)

(b) Work out $\frac{2}{3} \times \frac{7}{12}$

Give your answer as a fraction in its simplest form.

$$\frac{\overset{1}{\cancel{2}} \times 7}{3 \times \underset{6}{\cancel{12}}} = \frac{1 \times 7}{3 \times 6} = \frac{7}{18}$$

$$\frac{7}{18}$$

(2)

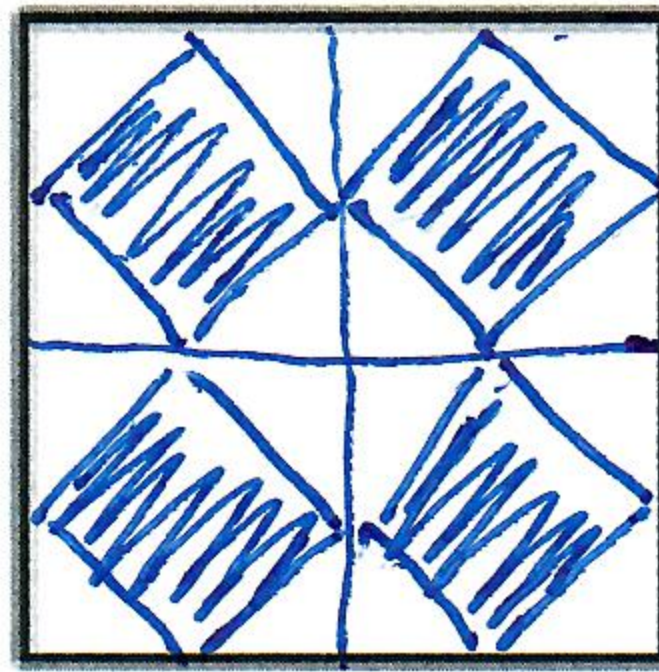
(Total for Question 19 is 4 marks)



20 Here are two squares, A and B.



A



B

The length of the side of square A is 50% of the length of the side of square B.

Express the area of the shaded region of square A as a percentage of the area of square B.

Area  = Area  So half of A is shaded.

Half the area of each of the A's is shaded

∴ half of B is shaded.

50

%

(Total for Question 20 is 3 marks)



- 21 There are 75 students at a school. Total
 Each student walks to school or cycles to school or gets the bus to school.

There are 40 girls in the school.
 15 of the girls walk to school.
 3 of the boys cycle to school.
 24 of the 45 students who get the bus to school are boys.

Find the number of these students who walk to school.

	Walks	Cycles	Bus	Total
Boys	$35 - (3 + 24)$ $= 8$ ②	3	24	$75 - 40$ $= 35$ ①
Girls	15	$7 - 3 = 4$ ⑤	$40 - (15 + 4)$ $= 21$ ⑥	40
Total	$8 + 15 =$ ③ 23	$75 - (45 + 23)$ $= 7$ ④	45	75

Circled numbers is the order in which I did these

23

(Total for Question 21 is 4 marks)



22 There are only blue cubes, red cubes and yellow cubes in a box.

The table shows the probability of taking at random a blue cube from the box.

Colour	blue	red	yellow
Probability	0.4	0.4	0.2

There are twice as many red cubes as yellow cubes in the box.

(a) Complete the table.

$$1 - 0.4 = 0.6$$

$$1 + 2 = 3 \text{ parts } 0.6 \div 3 = 0.2$$

$$\text{Red } 0.2 \times 2 = 0.4$$

$$\text{Yellow } 1 \times 0.2 = 0.2$$

(2)

There are 20 yellow cubes in the box.

(b) Work out the total number of cubes in the box. *Number of cubes = x*

$$20 = 0.2 \times x$$

$$20 = \frac{1}{5}x$$

$$100 = x$$

Convert to fractions

x5

$$\therefore x = 100 \text{ cubes}$$

100

(2)

(Total for Question 22 is 4 marks)



23 Deon needs 75 g of sugar to make 15 biscuits.

She also needs

three times as much flour as sugar

two times as much butter as sugar

Deon is going to make 80 biscuits.

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

for 15 biscuits:

$$\text{Flour} = 3 \times 75 = 225 \text{ g.}$$

for 1 biscuit

$$\text{Flour} = \frac{225}{15} = 15 \text{ g}$$

for 80 biscuits

$$\text{Flour} = 15 \times 80 = 1200 \text{ g}$$

1200
.....
(3)

Deon has to buy all the butter she needs to make 80 biscuits.

She buys the butter in 400 g packs.

(b) How many packs of butter does Deon need to buy?

$$75 \times 2 = 150 \text{ for 15 biscuits}$$

$$150 \div 15 = 10 \text{ g for 1 biscuit}$$

$$80 \times 10 = 800 \text{ g for 80 biscuits}$$

$$\frac{800}{400} = 2 \text{ packs of butter}$$

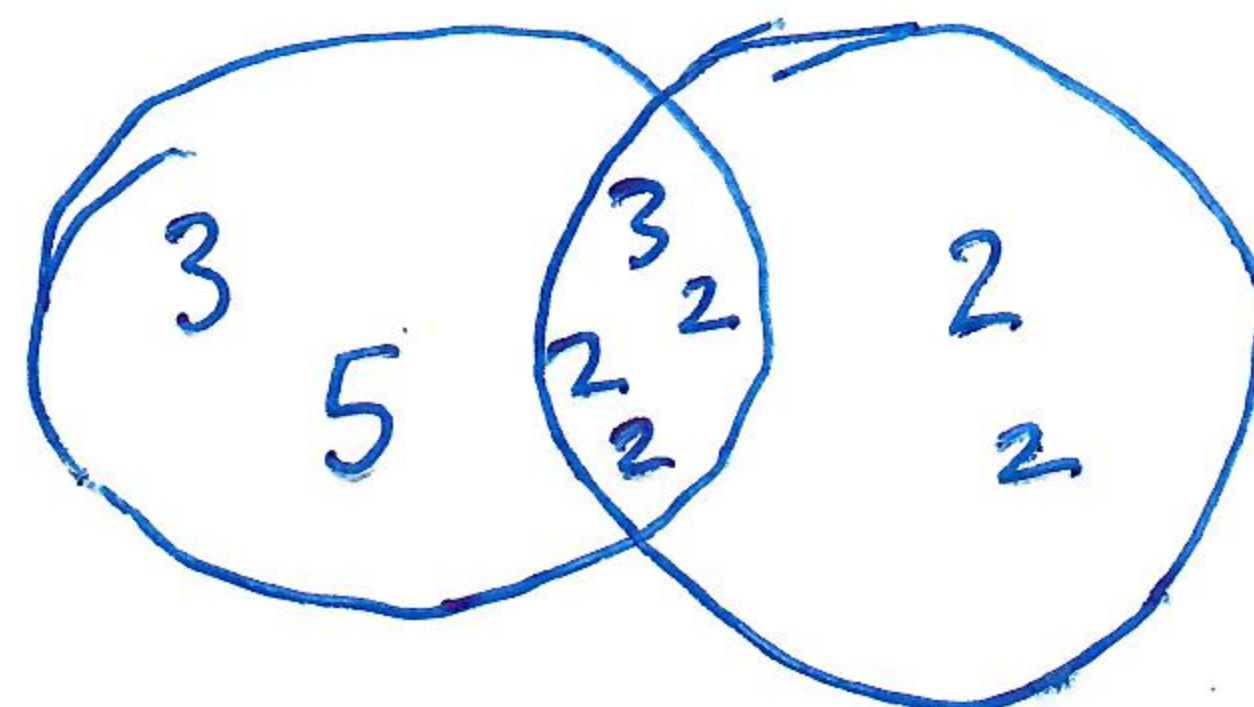
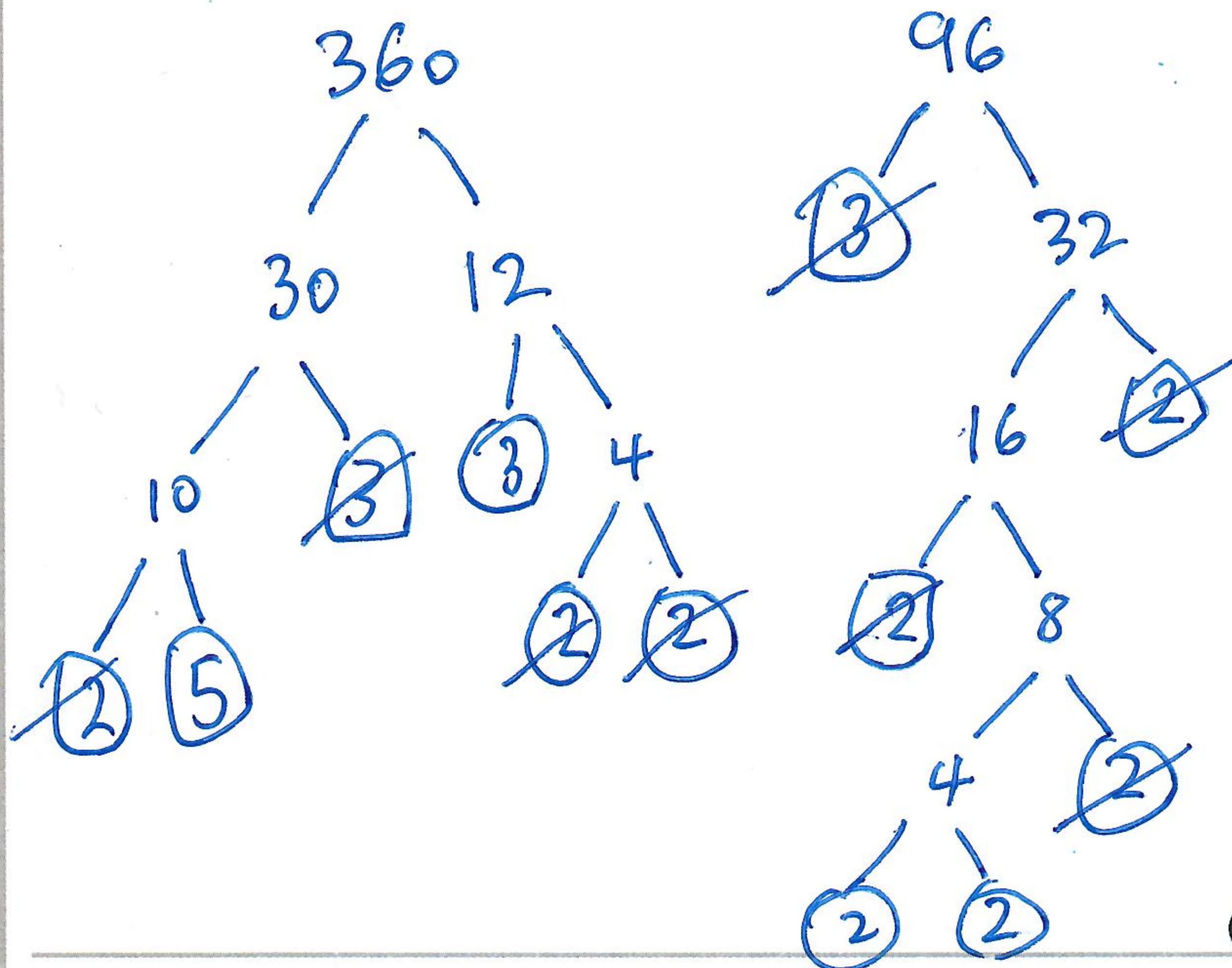
2

.....
(2)

(Total for Question 23 is 5 marks)



24 Find the highest common factor (HCF) of 360 and 96



$$\text{HCF} = 2 \times 2 \times 2 \times 3 \\ = 24$$

24

(Total for Question 24 is 2 marks)

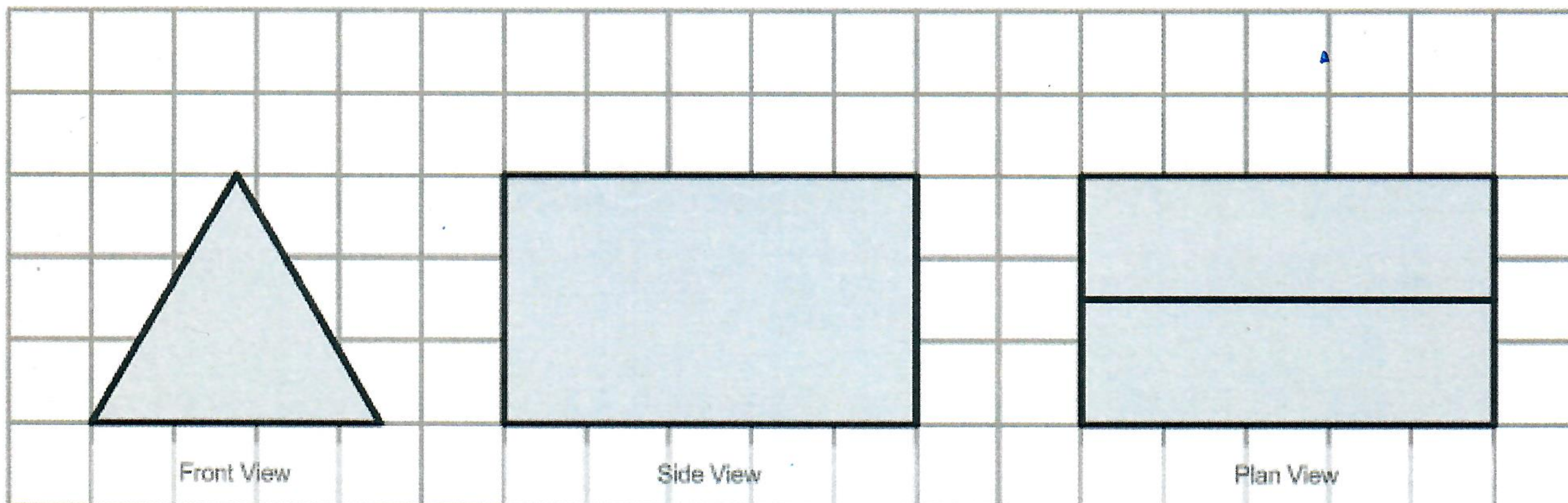
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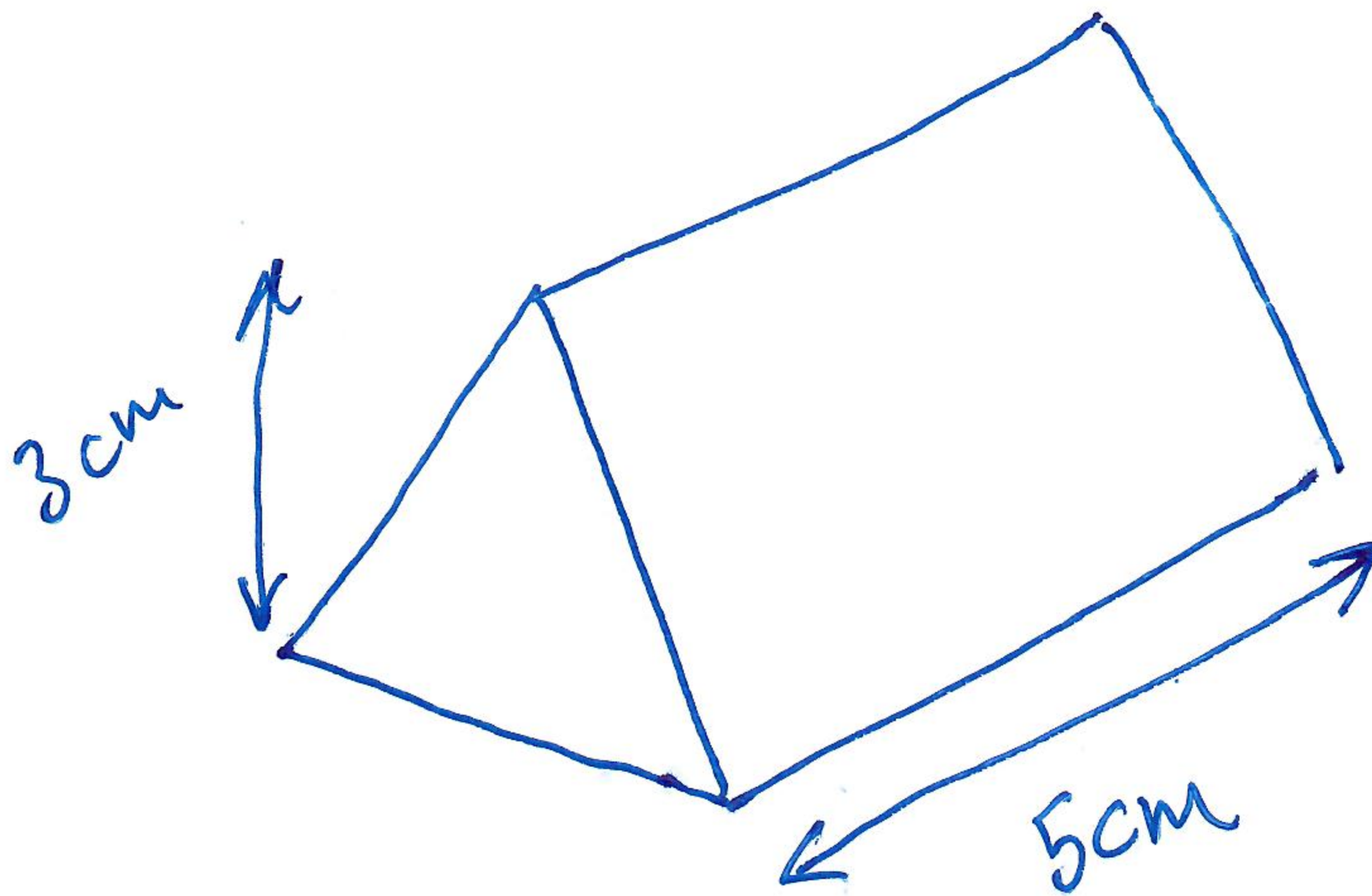
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- 25 The diagram shows the plan, front elevation and side elevation of a solid shape, drawn on a centimetre grid.

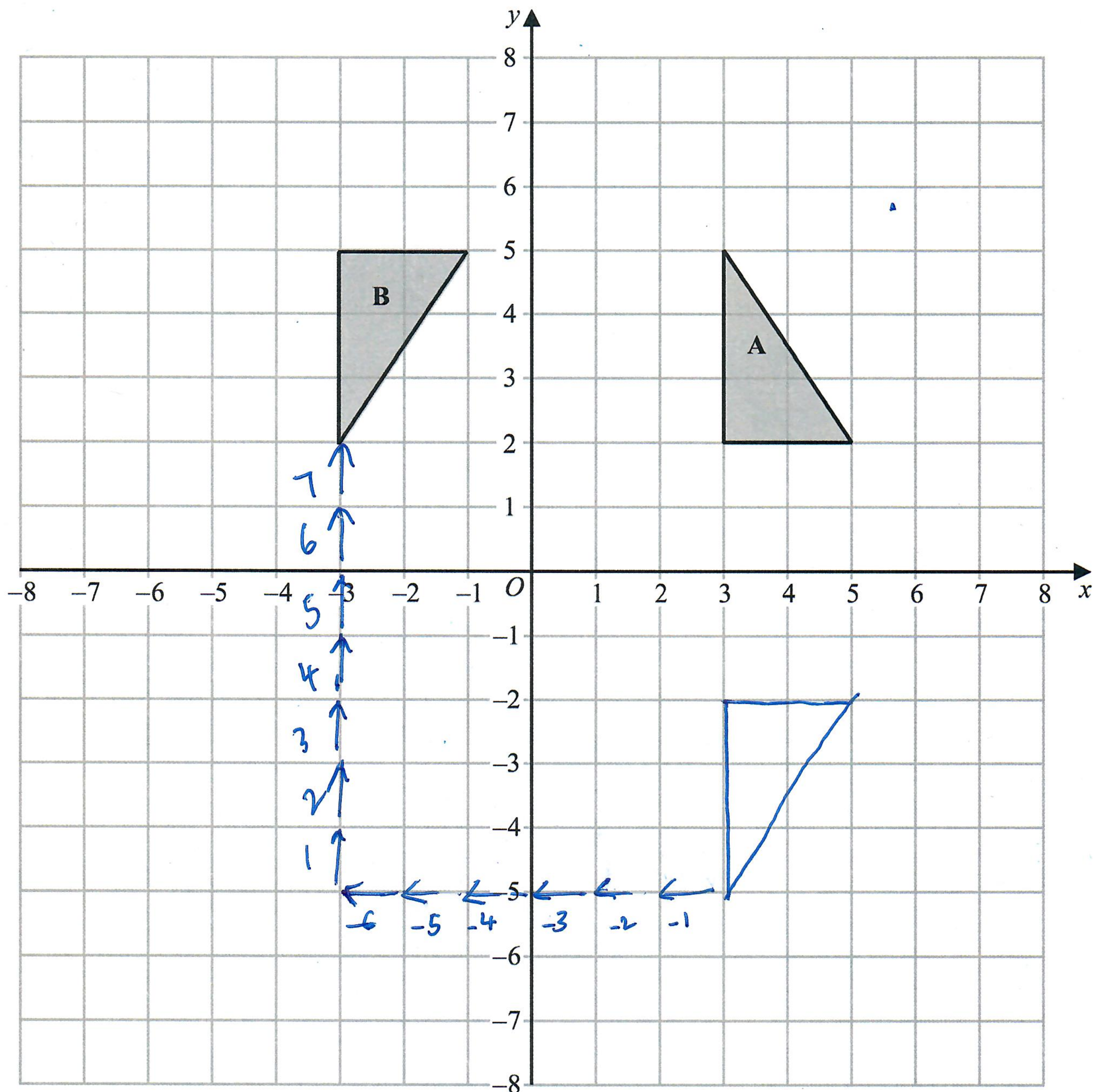


In the space below, draw a sketch of the solid shape.
Give the dimensions of the solid on your sketch.



(Total for Question 25 is 2 marks)





Shape A can be transformed to shape B by a reflection in the x -axis followed by a translation $\begin{pmatrix} c \\ d \end{pmatrix}$

Find the value of c and the value of d .

$c = \dots -6 \dots$

$d = \dots 7 \dots$

(Total for Question 26 is 3 marks)



27 A shop sells packs of black pens, packs of red pens and packs of green pens.

There are

5 pens in each pack of black pens

10 pens in each pack of red pens

5 pens in each pack of green pens

On Monday,

number of packs of black pens sold : number of packs of red pens sold : number of packs of green pens sold = 9 : 4 : 3

A total of 500 pens were sold.

Work out the number of green pens sold.

No of Pens of each colour

Black Red Green

$$5 \times 9 = 45 : 10 \times 4 = 40 : 5 \times 3 = 15$$

$$45 : 40 : 15$$

What fraction of the pens are green?

$$\text{Green} = \frac{15}{45+40+15} = \frac{15}{100} = \frac{3}{20}$$

Number of green pens:

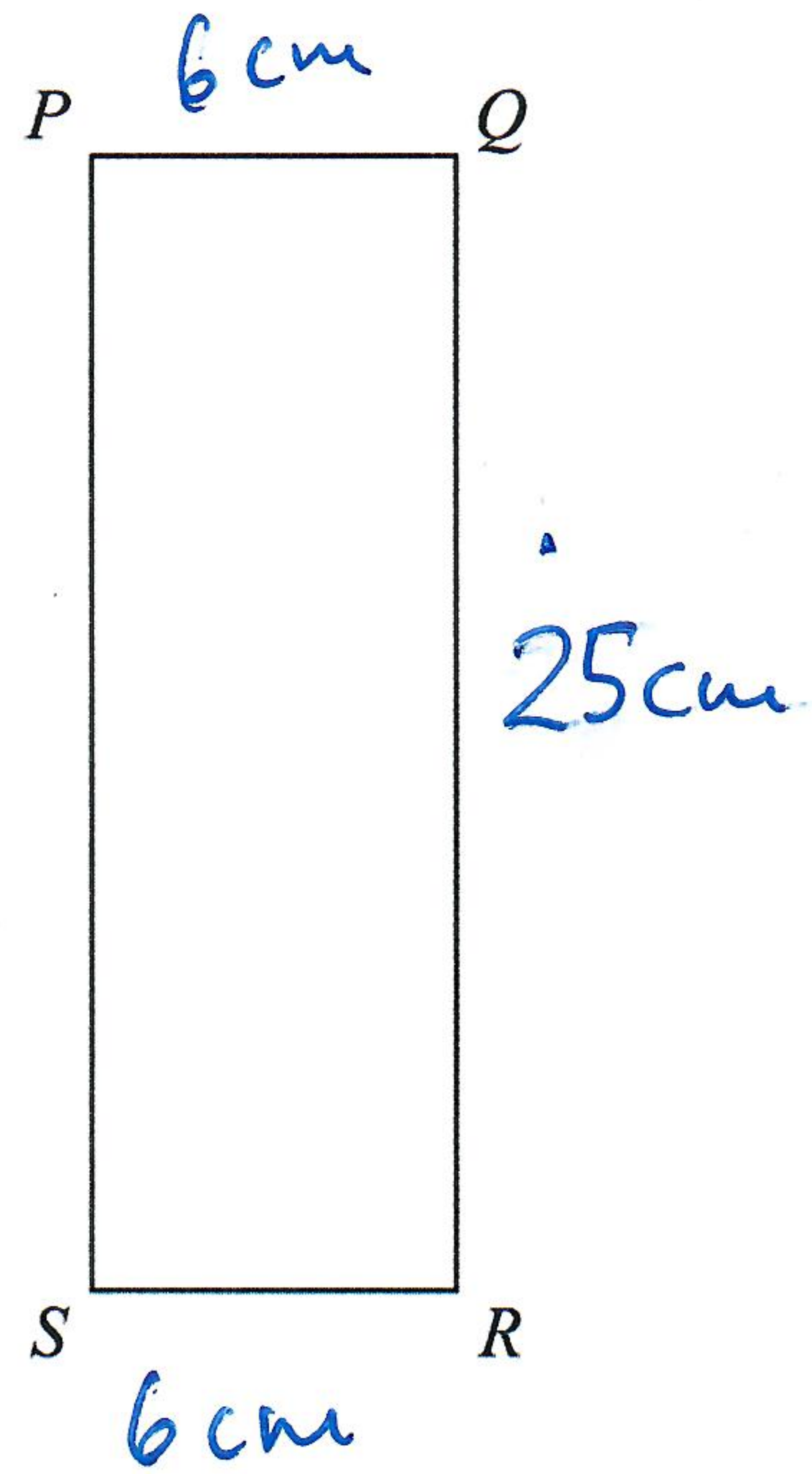
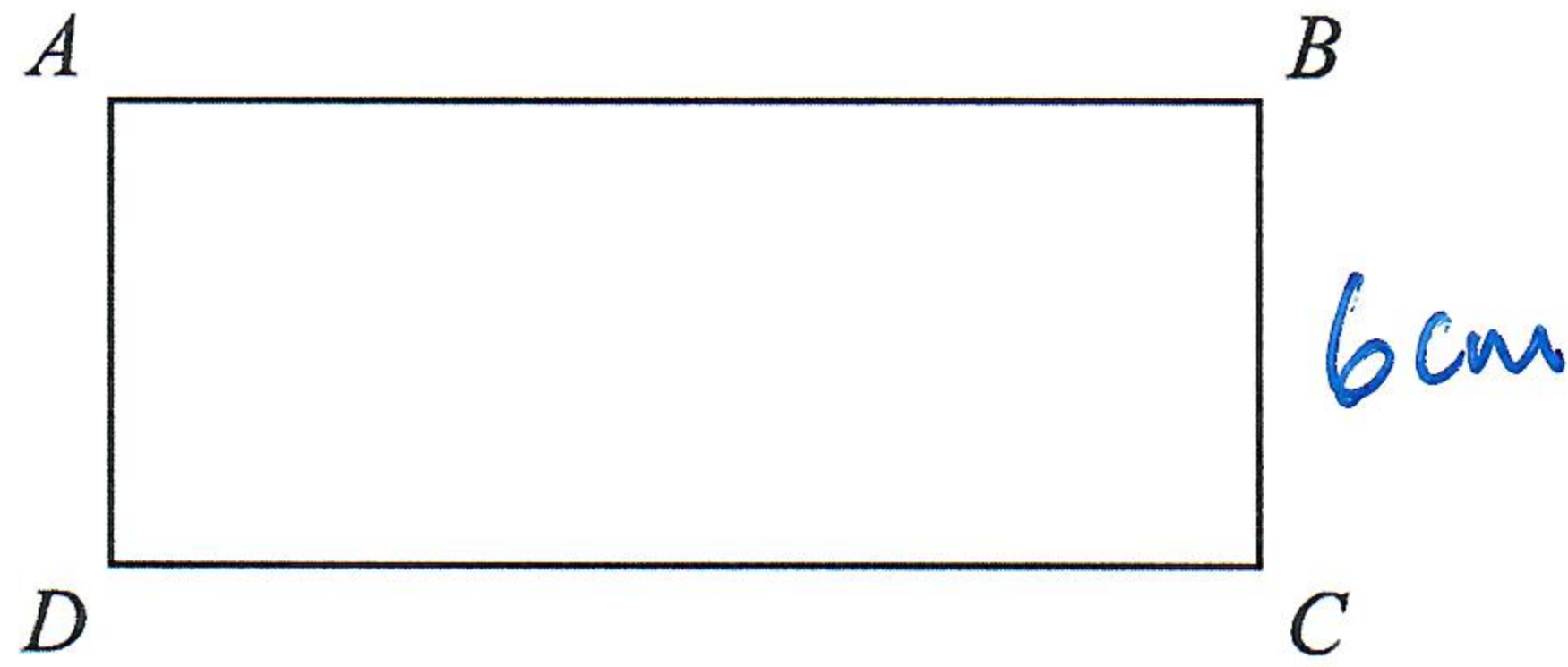
$$\frac{3}{20} \times 500 = 3 \times 25 = 75$$

75

(Total for Question 27 is 4 marks)



28 Here are two rectangles.



$$QR = 25\text{cm}$$

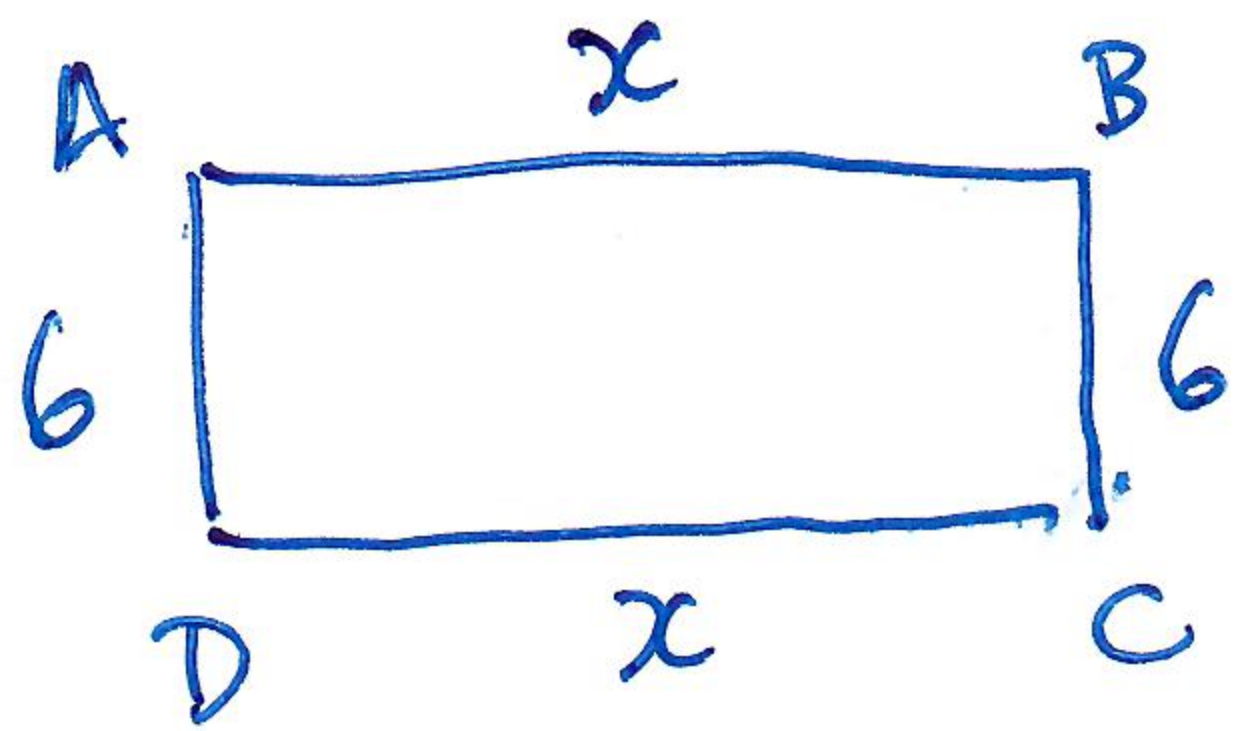
$$BC = PQ$$

The perimeter of $ABCD$ is 38 cm

The area of $PQRS$ is 150 cm^2

Find the length of AB .

$$150 \div 25 = 6\text{ cm}$$



$$x + x + 6 + 6 = 38$$

$$\begin{aligned} \therefore 2x + 12 &= 38 \\ -12 \quad \swarrow & \\ 2x &= 26 \\ \div 2 \quad \swarrow & \\ x &= 13 \end{aligned}$$

.....13..... cm

(Total for Question 28 is 4 marks)

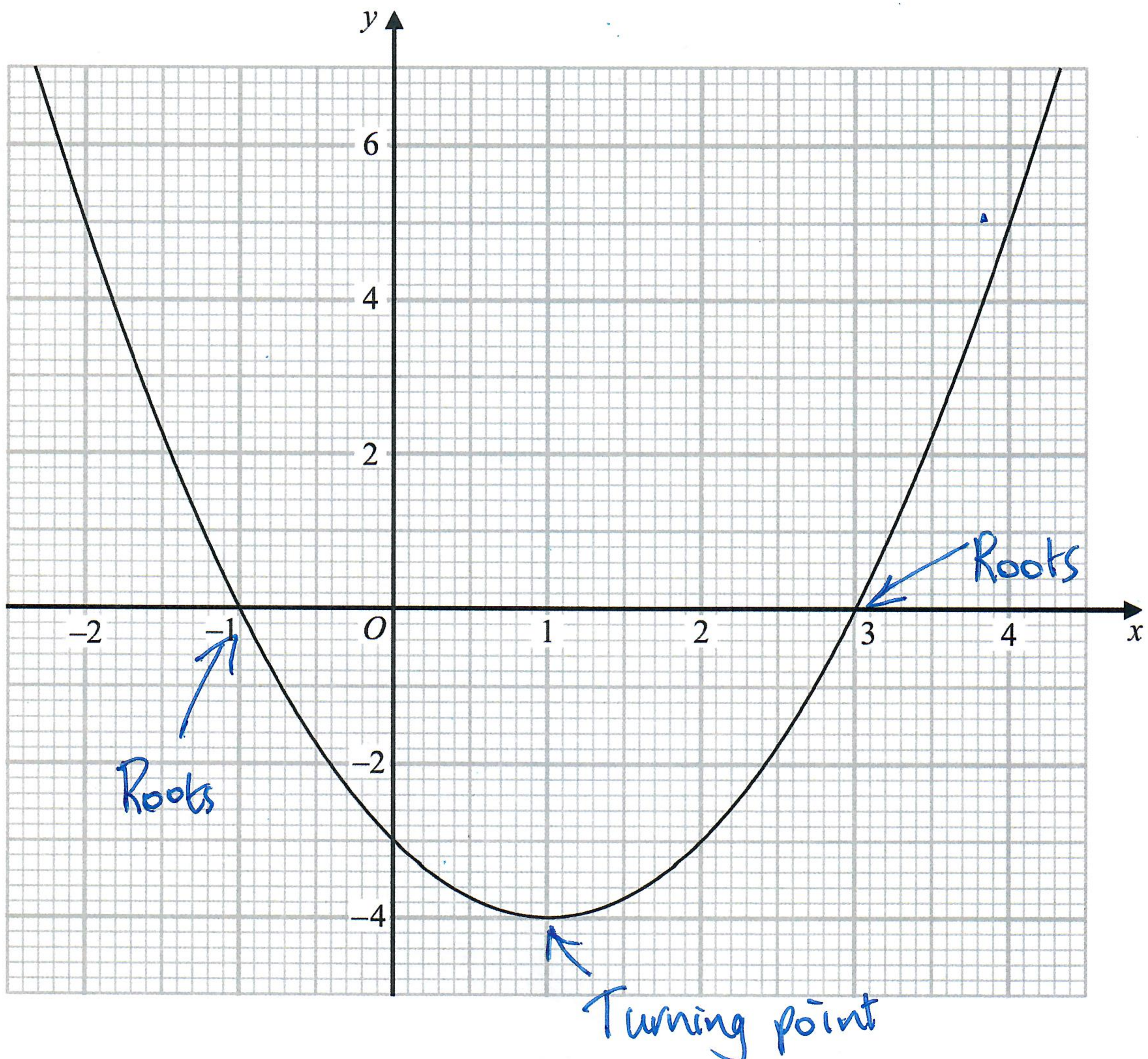
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29 Here is the graph of $y = x^2 - 2x - 3$



(a) Write down the coordinates of the turning point on the graph of $y = x^2 - 2x - 3$

(.....,)
(1)

(b) Use the graph to find the roots of the equation $x^2 - 2x - 3 = 0$

.....
(2)

(Total for Question 29 is 3 marks)

TOTAL FOR PAPER IS 80 MARKS



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Level 1/Level 2 GCSE (9–1)

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Candidate Number

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Thursday 6 June 2019

Morning (Time: 1 hour 30 minutes)

Paper Reference **1MA1/2F**

Mathematics Shadow Set B

Paper 2 (Calculator)

Foundation Tier

You must have: Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser, calculator. Tracing paper may be used.

Total Marks

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- Diagrams are **NOT** accurately drawn, unless otherwise indicated.
- **Calculators may be used.**
- If your calculator does not have a π button, take the value of π to be 3.142 unless the question instructs otherwise.



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

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Turn over ►

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Answer ALL questions.

Write your answers in the spaces provided.

You must write down all the stages in your

working. 1 Write 0.07 as a fraction.

$$\frac{7}{100}$$

(Total for Question 1 is 1 mark)

2 Write the following numbers in order of size.
Start with the smallest number.

0 -1 2 -9 -0.5

-9, -1, -0.5, 0, 2

(Total for Question 2 is 1 mark)

3 Write down two factors of 35

$$1 \times 35$$

$$5 \times 7$$

5, 7

(Total for Question 3 is 1 mark)

4 Change 3481 grams to kilograms.

3.481

$$3481 \div 1000$$

3.481 kg

(Total for Question 4 is 1 mark)

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5 Write the number twelve million in figures.

12,000,000

(Total for Question 5 is 1 mark)

6 Dave goes into a cafe and buys 2 cups of coffee and a piece of cake.

Each cup of coffee costs £3.55

The cake costs £3.90

Dave pays with a £20 note.

He thinks he will get more than £9.00 in change.

Is Dave correct?

You must show how you get your answer.

$$2 \times 3.55 = 7.10$$

$$7.10 + 3.90 = 11.00$$

$$\begin{array}{r} 20.00 \\ - 11.00 \\ \hline 9.00 \end{array}$$

Dave gets £9.00 change so he is wrong
as £9.00 is not more than £9.00.

(Total for Question 6 is 3 marks)



- 7 There are y boats on a lake.
There are 9 people in each boat.

Write an expression, in terms of y , for the total number of people in the boats.

$$9 \times y = 9y$$

$$9y$$

(Total for Question 7 is 1 mark)

- 8 (a) Simplify $a \times 2c \times 11$

$$2 \times 11 \times a \times c$$

$$22ac$$

(1)

- (b) Simplify $d \times d \times 2d$

$$2 \times d \times d \times d$$

$$2d^3$$

(1)

- (c) Simplify fully $\frac{f \times f}{e \times e \times f \times f}$

$$\frac{f \times f \quad 1}{e \times e \times \cancel{f \times f}}$$

$$\frac{1}{e^2} = e^{-2}$$

(2)

(Total for Question 8 is 4 marks)

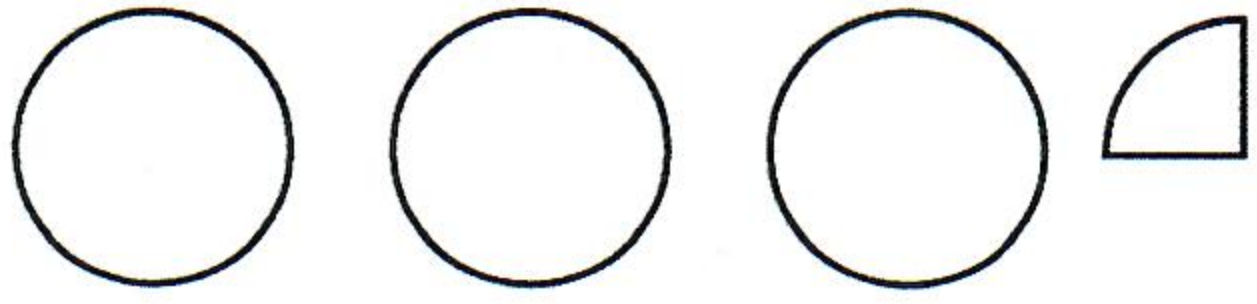
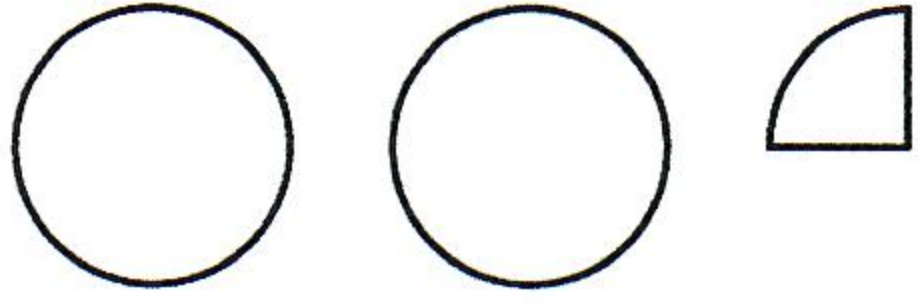

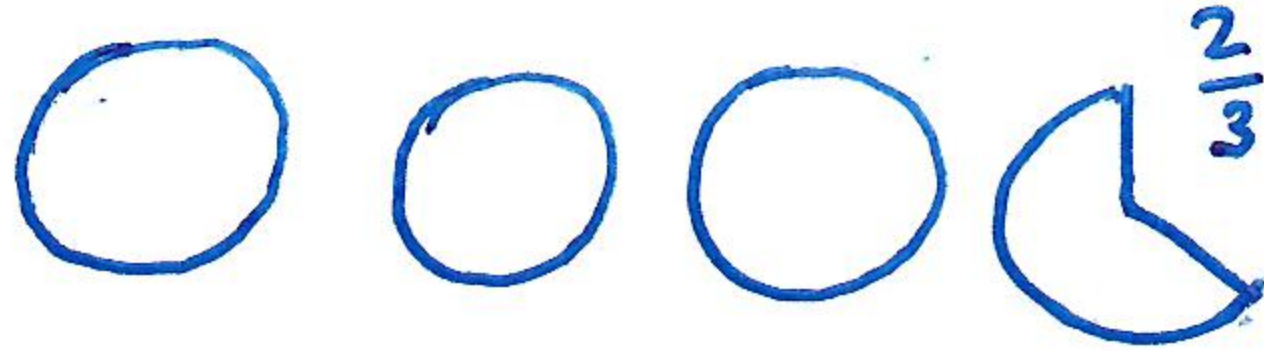


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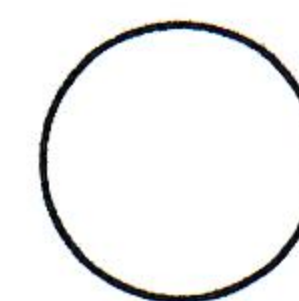
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- 9 The pictogram shows information about the number of vinyl records sold in a shop on Monday and on Tuesday.

Monday	
Tuesday	
Wednesday	
Thursday	

Key:



represents
12 vinyl records

- (a) Write down the number of vinyl records sold

- (i) on Monday,

$$(12 \times 3) + \left(\frac{1}{4} \times 12\right) = 36 + 3 = \underline{39} \quad (1)$$

- (ii) on Tuesday.

$$(12 \times 2) + \left(\frac{1}{4} \times 12\right) = 24 + 3 = \underline{27} \quad (1)$$

On Wednesday and Thursday a total of 66 vinyl records were sold.

The number of records sold on Thursday was 2 times the number of records sold on Wednesday.

- (b) Use this information to complete the pictogram.

$$2 + 1 = 3$$

$$\frac{66}{3} = 22$$

$$\text{Wed: } 22 \times 1 = 22$$

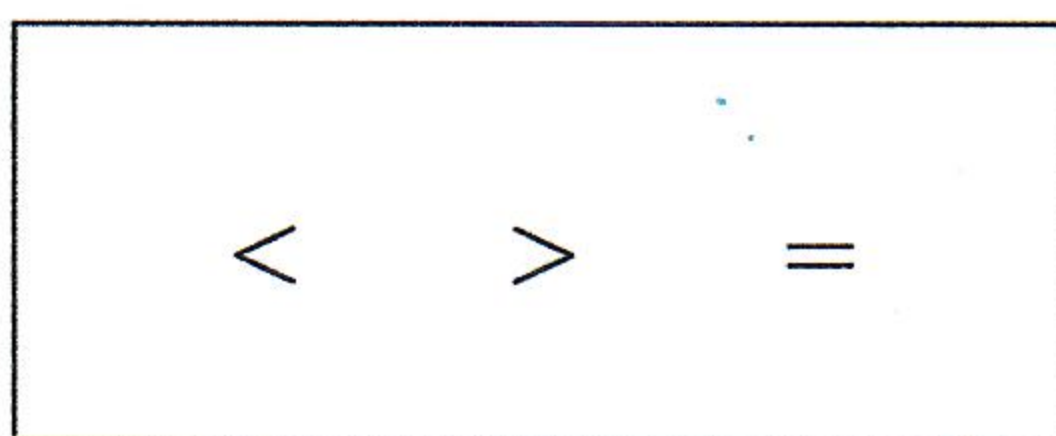
$$\text{Thurs: } 22 \times 2 = 44$$

(3)

(Total for Question 9 is 5 marks)



10 Here are three symbols.



Write one of these symbols in each box to make four true statements.

$$\begin{array}{ccc}
 8 & < & 25 \\
 12 & & 12 \\
 4 + 8 & = & 104 - 92 \\
 8 & & 9 \\
 2^3 & = & 2 \times 4 \\
 -1 & > & -1.5
 \end{array}$$

(Total for Question 10 is 2 marks)

11 $P = 3r - 6q$

Work out the value of P when $r = 6$ and $q = -9$

$$\begin{aligned}
 P &= 3(6) - 6(-9) \\
 &= 18 - (-54) \\
 &= 18 + 54 \\
 &= 72
 \end{aligned}$$

72

(Total for Question 11 is 2 marks)



12 Here is part of a train timetable.

Brighton	07 29	07 34	07 45
London	09 00	08 29	08 48

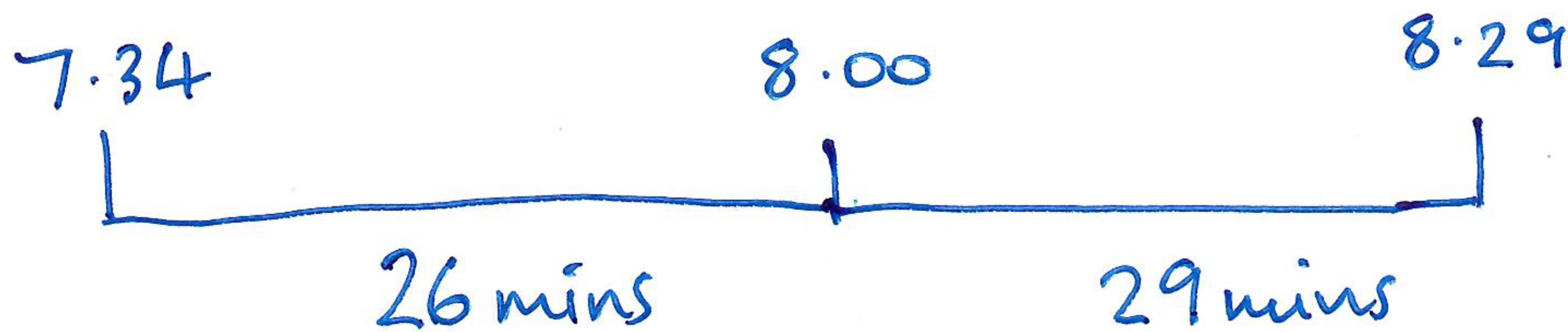
Graham gets to the station in Brighton at 07 07

(a) Work out how many minutes he has to wait until 07 29.

$$29 - 7 = 22$$

..... 22 minutes
(1)

(b) Work out how long it will take the 07 34 train to get to London.



$$\begin{array}{r} 26 \\ 29 + \\ \hline 55 \end{array}$$

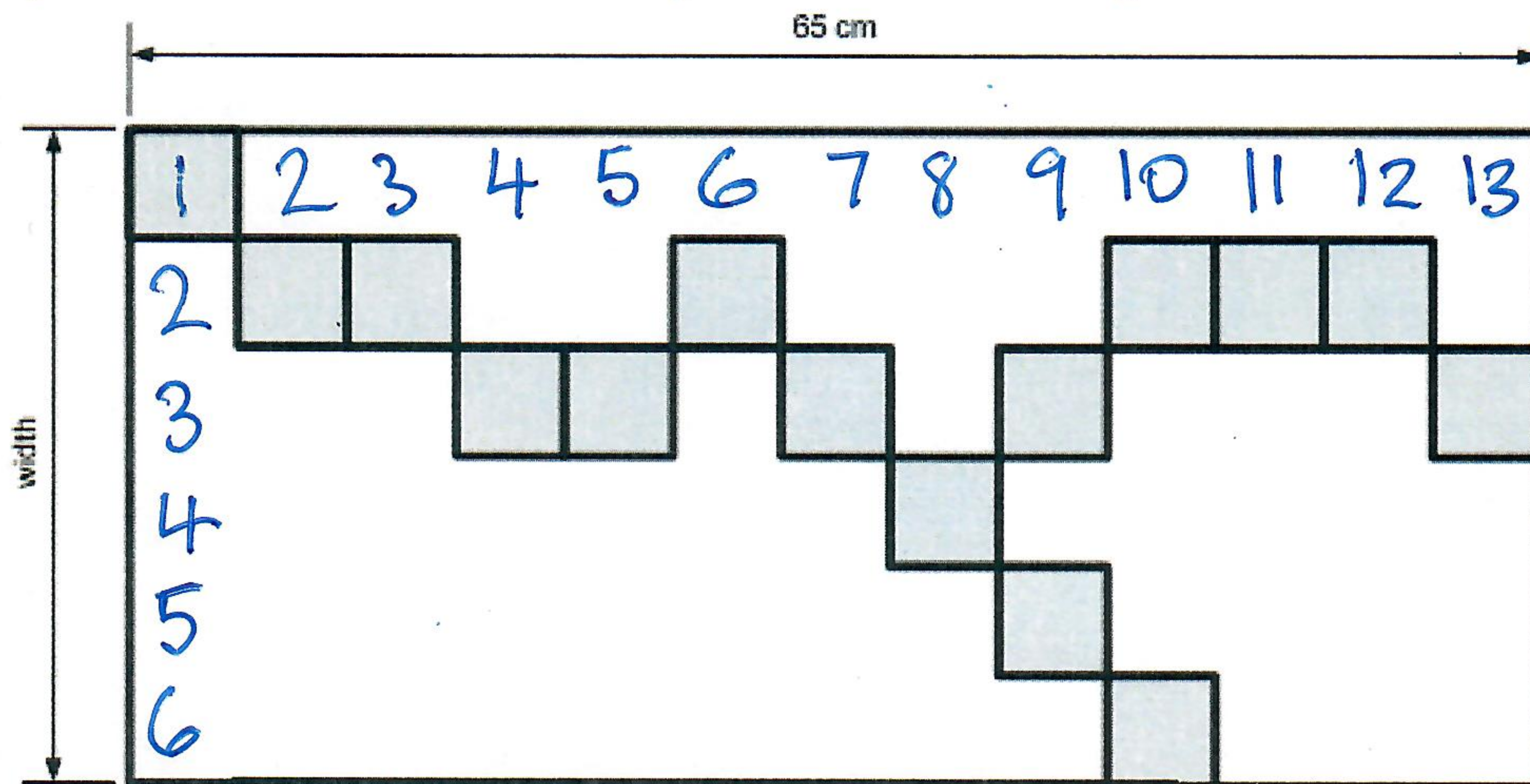
..... 55

(2)

(Total for Question 12 is 3 marks)



13 The diagram shows fifteen identical squares inside a rectangle.



The length of the rectangle is 65 cm.

Work out the width of the rectangle.

$$\frac{65}{13} = 5$$

$$6 \times 5 = 30 \text{ cm}$$

.....30.....cm

(Total for Question 13 is 3 marks)

DO NOT WRITE IN THIS AREA

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DO NOT WRITE IN THIS AREA



14 Write the ratio $8 : 2.5$ in the form $n : 1$

$$\begin{array}{l} 8 : 2.5 \\ \div 2.5 \quad \swarrow \quad \searrow \quad \div 2.5 \\ 3.2 : 1 \end{array}$$

$$\underline{3.2 : 1}$$

(Total for Question 14 is 1 mark)

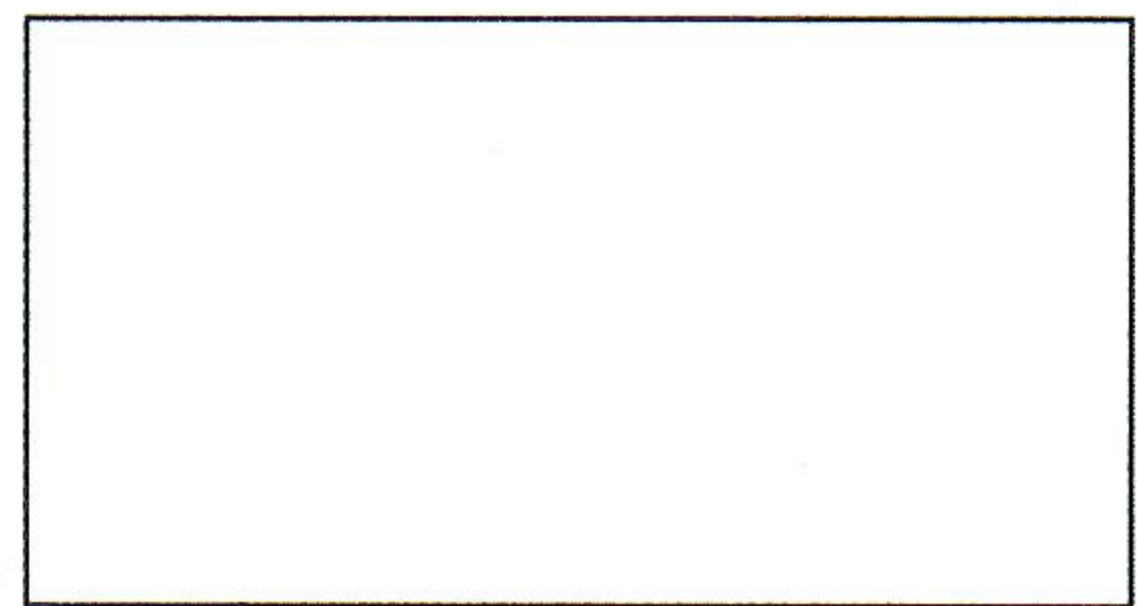
15 A garden is in the shape of a rectangle 50 m by 30 m.

50 m

Flowers are grown in 60% of the garden.

The rest of the garden is grass.

Work out the area of the garden that is grass.



30 m

$$100 - 60 = 40\% \text{ is grass}$$

Area of garden

$$50 \times 30 = 1500 \text{ m}^2$$

Area of grass

$$\frac{40}{100} \times 1500 = 40 \times 15 = 600 \text{ m}^2$$

$$\underline{600} \text{ m}^2$$

(Total for Question 15 is 4 marks)



16 Four biased coins, A, B, C and D are thrown.

The probability that each coin will land on Heads is shown in the table.

Coin	Probability
A	0.55
B	0.055
C	$\frac{1}{5}$ 0.2
D	50% 0.5

(a) (i) Which coin is least likely to land on Heads?

B

(1)

(ii) Which coin is most likely to land on Heads?

A

(1)

Julie says,

“The probability that coin C will land on Heads is the same as the probability that coin C will land on Tails.”

(b) Is she correct?

Give a reason for your answer.

No because all possible outcomes have a probability of 1. If the probability of C landing on heads is 0.2, the probability of tails is $1 - 0.2$ which is 0.8.

(1)

Coin B is going to be thrown 8000 times.

(c) Work out an estimate for the number of times coin B will land on Heads.

$$8000 \times 0.055 = 440$$

440

(2)

(Total for Question 16 is 5 marks)



- 17 There are 84 calories in 100g of banana.
There are 87 calories in 100g of yogurt.

Priti has 115g of banana and 205g of yogurt for breakfast.

Work out the total number of calories in this breakfast.

$$\frac{115}{100} \times 84 = 96.6 \text{ calories}$$

$$\frac{205}{100} \times 87 = 178.35$$

$$178.35 + 96.6 = 274.95$$

274.95

(Total for Question 17 is 4 marks)



18 Machine A and machine B both make car parts.

Machine A makes 5 parts every 12 minutes.

Machine B makes 8 parts every 20 minutes.

On Monday

machine A makes parts for 5 hours

machine B makes parts for 16 hours

Work out the total number of parts made by the two machines on Monday.

Machine A

$$\frac{60}{12} \times 5 = 25 \text{ parts per hour}$$

$$25 \times 5 \text{ hrs} = 125 \text{ parts}$$

Machine B

$$\frac{60}{20} \times 8 = 24 \text{ parts per hour}$$

$$24 \times 16 = 384 \text{ parts}$$

Total

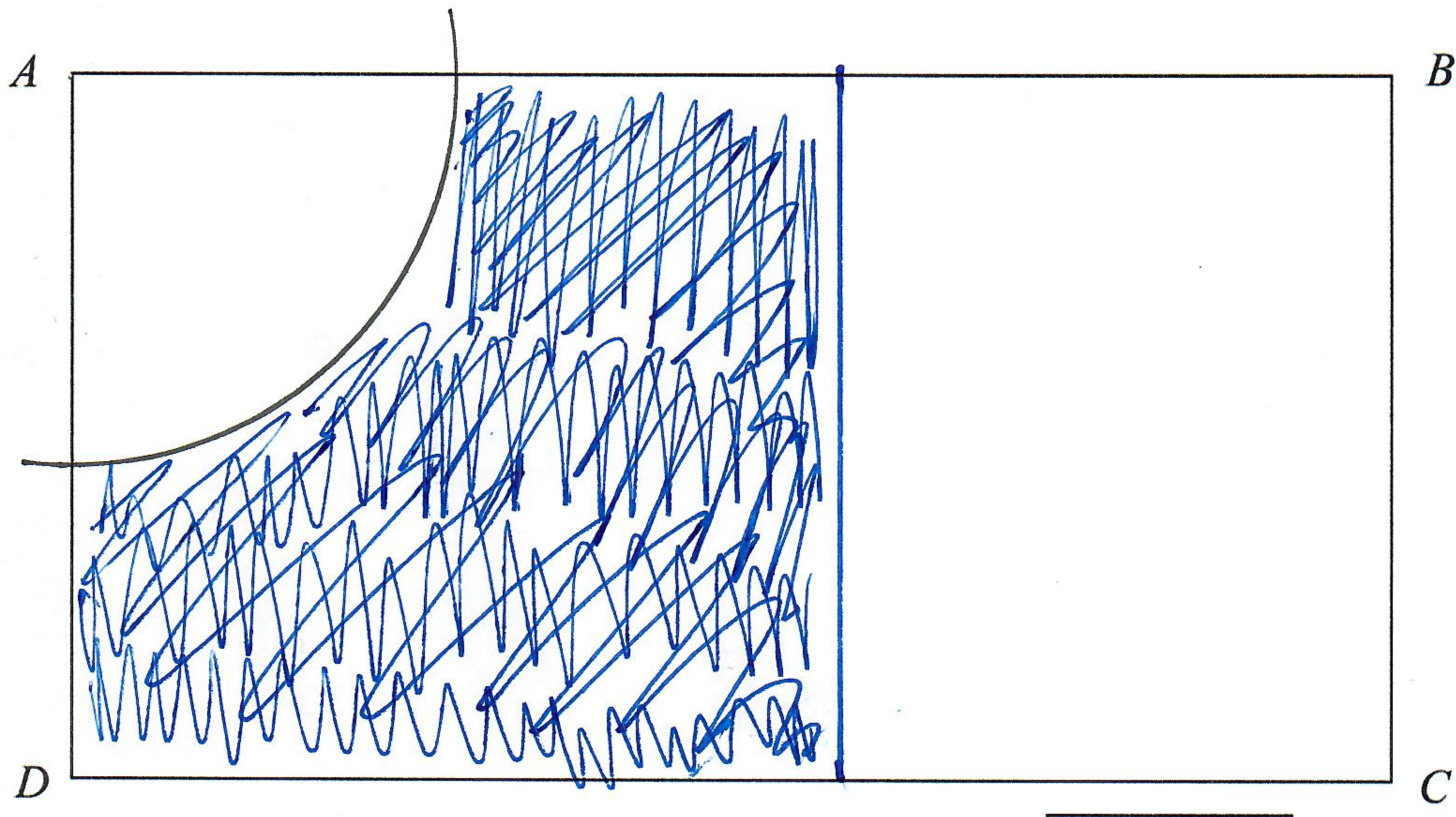
$$\begin{array}{r} 384 \\ 125 + \\ \hline 409 \end{array}$$

409 parts

(Total for Question 18 is 4 marks)



19 Here is a plan of a kitchen drawn to a scale of 1:50



Scale 1:50

Sam is going to put a small table in the kitchen.

The table has to be

more than 175 cm from A

more than 250 cm from BC

Show, by shading on the diagram, the region where Sam can put the table.

$$(250 \div 50) \times 1 = 5 \text{ cm}$$

$$(175 \div 50) \times 1 = 3.5 \text{ cm}$$

(Total for Question 19 is 4 marks)



20 (a) Solve $17n > 12n + 18$

$$\begin{aligned} 17n &> 12n + 18 \\ -12n & \quad \swarrow \\ 5n &> 18 \\ \div 5 & \quad \swarrow \\ n &> 3.6 \end{aligned}$$

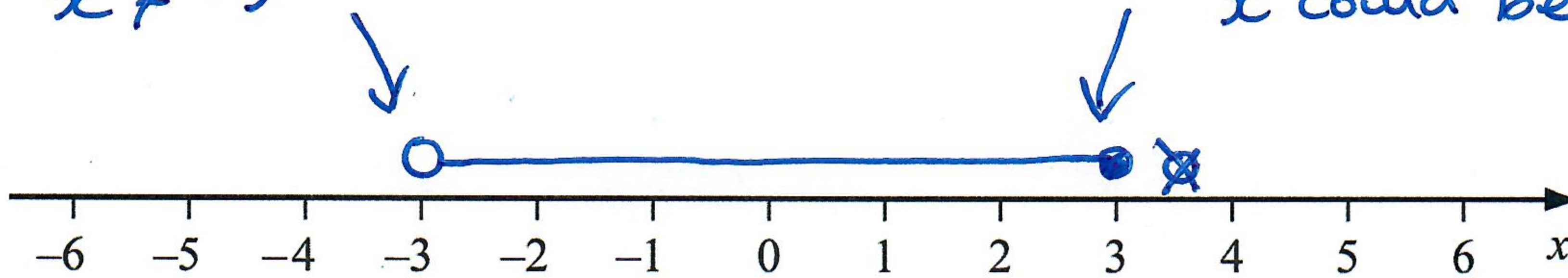
$$\underline{n > 3.6}$$

(2)

(b) On the number line below, show the set of values of x for which $-2 < x + 1 \leq 4$

Open circle because
 $x \neq -3$

Closed circle because
 x could be 3.



$$\begin{aligned} -2 &< x + 1 \leq 4 \\ -1 & \quad \swarrow \\ -3 &< x \leq 3 \end{aligned}$$

(3)

(Total for Question 20 is 5 marks)

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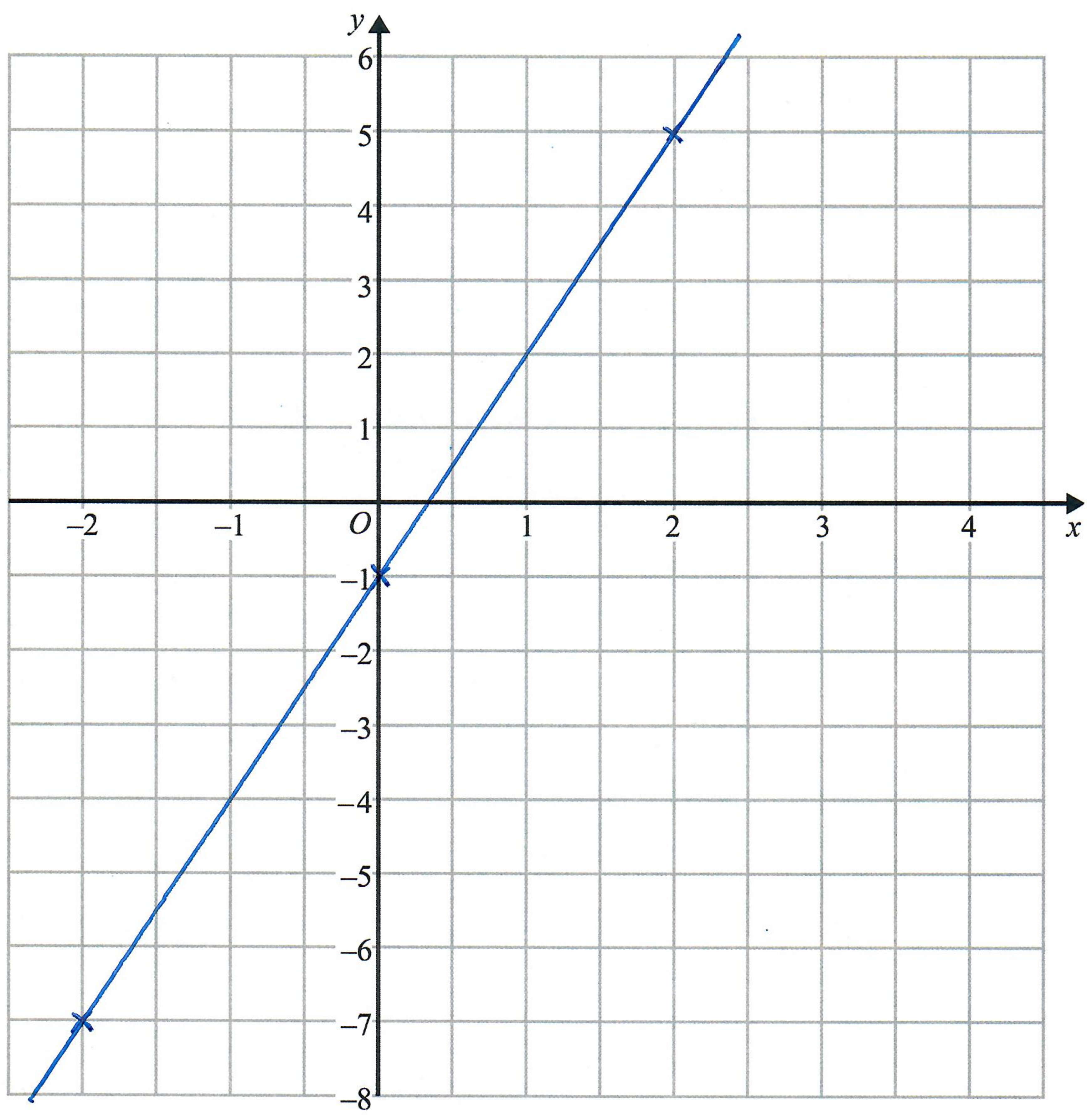
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21 On the grid below, draw the graph of $y = 3x - 1$ for values of x from -2 to 2

x	-2	0	2
y	-7	-1	5



(Total for Question 21 is 3 marks)



22 Hannah is planning a day trip for 210 students.

She asks a sample of 25 students where they want to go.
Each student chooses one place.

The table shows information about her results.

Place	Number of students
Theme Park	4
Theatre	9
Sports Centre	5
Seaside	7

(i) Work out how many of the 210 students you think will want to go to the Theme Park.

$$\frac{4}{25} \times 210 = 33.6$$

So it would be about 34 students

34

(2)

(ii) State any assumption you made and explain how this may affect your answer.

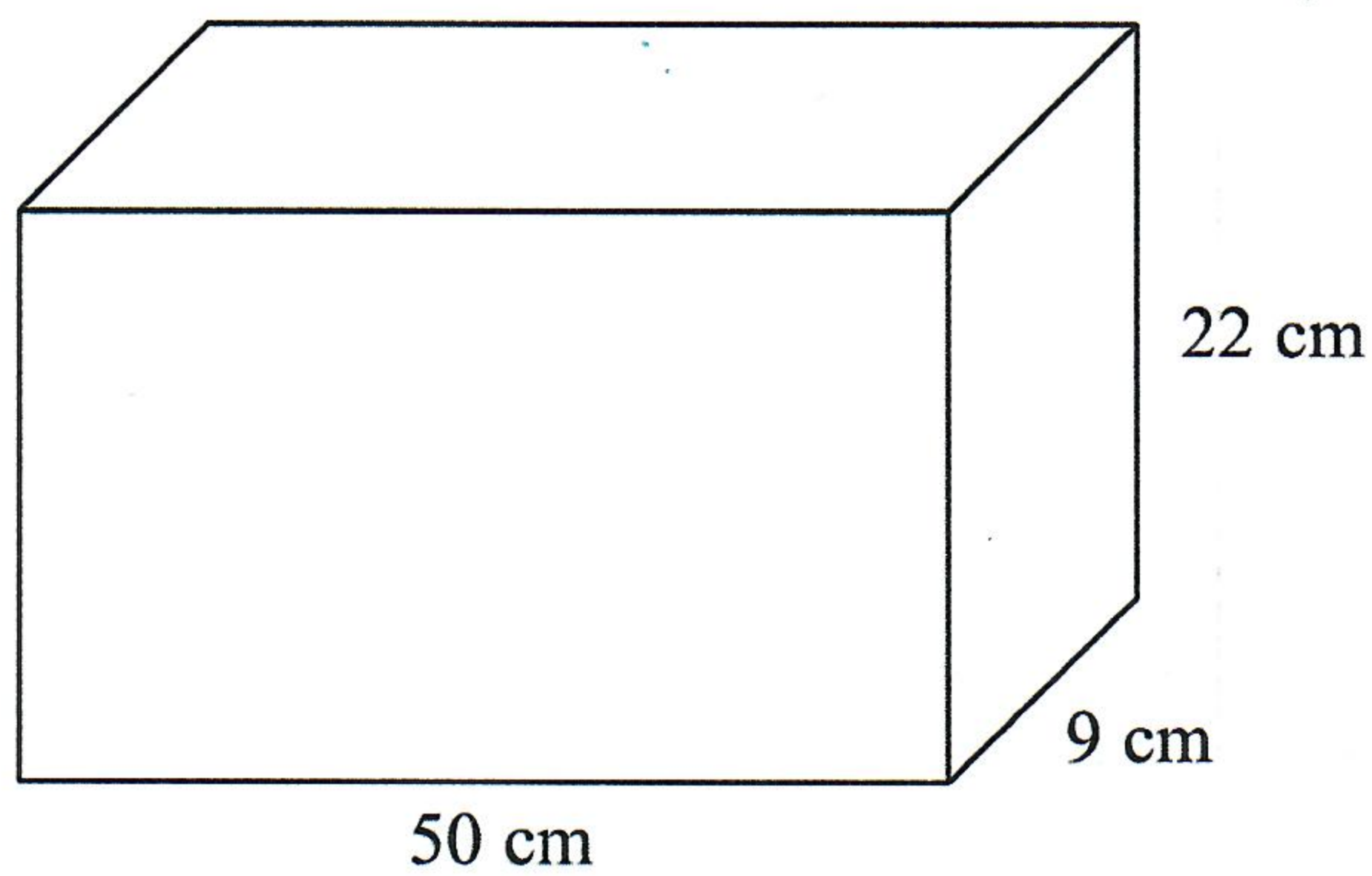
The sample was a random sample which was ~~suppose~~ representative of the whole student body. If it wasn't, then any number of people could have wanted to go to the theme park.

(1)

(Total for Question 22 is 3 marks)



23 A container is in the shape of a cuboid.



The container is $\frac{2}{3}$ full of water.

A cup holds 245 ml of water.

What is the greatest number of cups that can be completely filled with water from the container?

$$\begin{aligned}\text{Volume of container} &= l \times b \times h \\ &= 50 \times 9 \times 22 \\ &= 9900 \text{ ml}\end{aligned}$$

$$\begin{aligned}\text{Volume of water} &= \frac{2}{3} \times 9900 \\ &= 6600 \text{ ml.}\end{aligned}$$

$$\begin{aligned}\text{Number of cups} &= 6600 \div 245 \\ &= 26.93877551 \text{ cups.}\end{aligned}$$

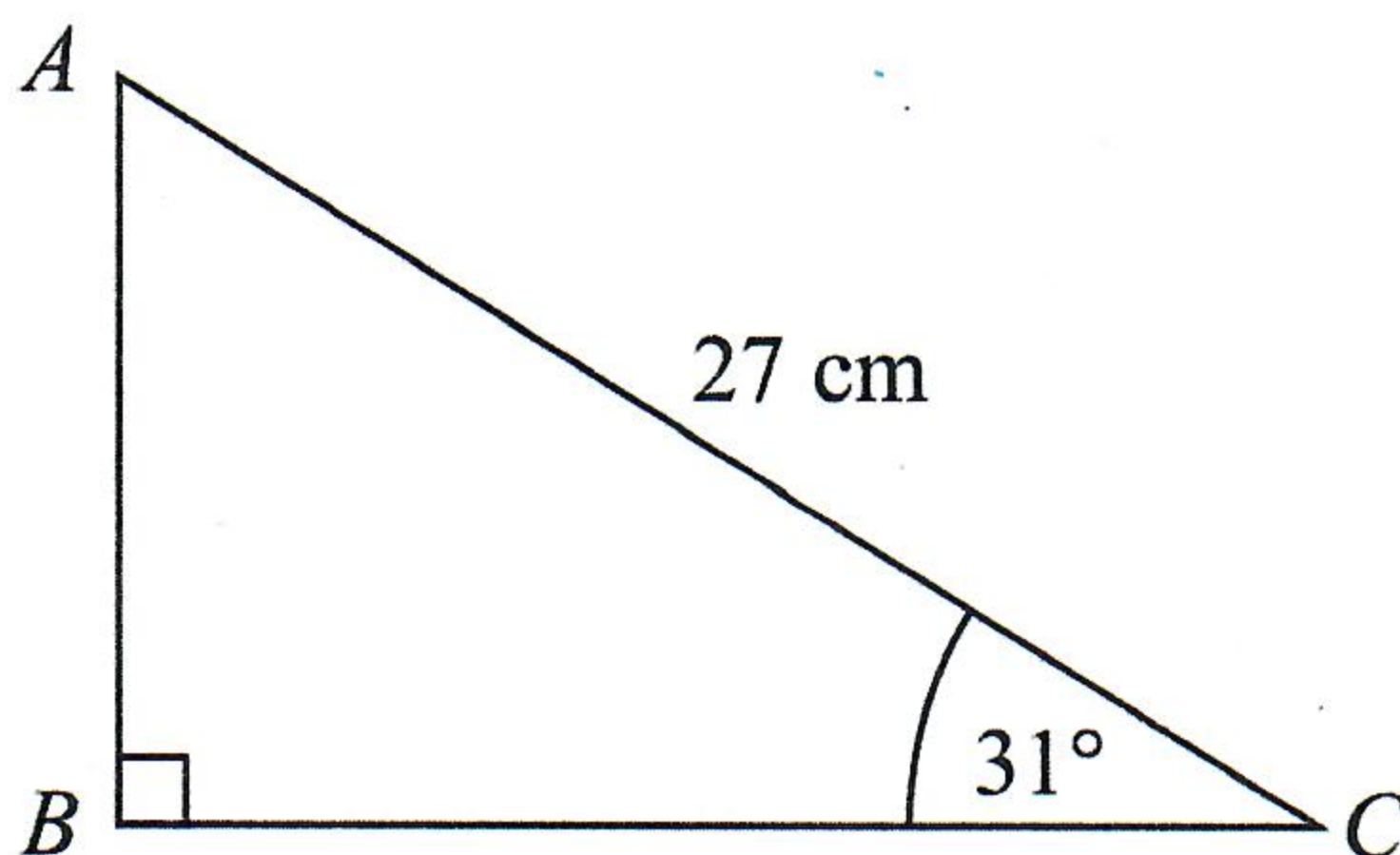
Greatest number of cups completely filled is 26

..... 26

(Total for Question 23 is 4 marks)



24 ABC is a right-angled triangle.



Calculate the length of AB .

Give your answer correct to 2 decimal places.

$$\sin = \frac{O}{H} \quad \cos = \frac{A}{H} \quad \tan = \frac{O}{A}$$

$$\sin 31^\circ = \frac{AB}{27}$$

$$\begin{aligned} \therefore AB &= \sin 31 \times 27 \\ &= 13.90602802 \text{ cm} \\ &\approx 13.91 \end{aligned}$$

..... 13.91 cm

(Total for Question 24 is 2 marks)

25 Sally used her calculator to work out the value of a number y .

The answer on her calculator display began

8.9 ← Truncated decimal

Complete the error interval for y .

$$\dots\dots 8.90 \leq y < 9.00 \dots\dots$$

(Total for Question 25 is 2 marks)



26 £540 is shared between Abby, Ben, Chloe and Denesh.

The ratio of the amount Abby gets to the amount Ben gets is 2:7

Chloe and Denesh each get 1.5 times the amount Abby gets.

Work out the amount of money that Ben gets.

$$\begin{array}{cccc} A & B & C & D \\ 2 & : & 7 & : & 3 & : & 3 \end{array}$$

No of parts: $2 + 7 + 3 + 3 = 15$

one part: $\frac{540}{15} = 36$

Ben gets: $7 \times 36 = 252$

£ 252.00

(Total for Question 26 is 4 marks)

27 (a) Write 0.007324 in standard form.

$$\frac{7.324 \times 10^{-3}}{(1)}$$

(b) Write 3.49×10^4 as an ordinary number.

$$3.49000000$$

$$\frac{34,900}{(1)}$$

(Total for Question 27 is 2 marks)



28 Here are the first five terms of a Fibonacci sequence.

6 6 12 18

(a) Write down the next two terms of the sequence.

$$12 + 18 = 30 \quad 18 + 30 = 48$$

$$\frac{30 \quad 48}{(1)}$$

The first three terms of a different Fibonacci sequence are

k k $2k$

(b) Find the 8th term of this sequence.

$k, k, 2k, 3k, 5k, 8k, 13k, 21k$

$$\frac{21k}{(2)}$$

(Total for Question 28 is 3 marks)

29 $a = \begin{pmatrix} 4 \\ 5 \end{pmatrix}$ $b = \begin{pmatrix} 3 \\ 7 \end{pmatrix}$

Work out $a - 3b$ as a column vector.

$$\begin{pmatrix} 4 \\ 5 \end{pmatrix} - 3 \begin{pmatrix} 3 \\ 7 \end{pmatrix} = \begin{pmatrix} 4 \\ 5 \end{pmatrix} - \begin{pmatrix} 9 \\ 21 \end{pmatrix} = \begin{pmatrix} -5 \\ -16 \end{pmatrix}$$

$$\begin{pmatrix} -5 \\ -16 \end{pmatrix}$$

(Total for Question 29 is 2 marks)

TOTAL FOR PAPER IS 80 MARKS



Please check the examination details below before entering your candidate information

Candidate surname

Other names

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

Centre Number

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Candidate Number

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Tuesday 11 June 2019

Morning (Time: 1 hour 30 minutes)

Paper Reference **1MA1/3F**

Mathematics Shadow Set B

Paper 3 (Calculator)

Foundation Tier

You must have: Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser, calculator. Tracing paper may be used.

Total Marks

Instructions

- Use **black** ink or ball-point pen.
- **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 be used.**
- If your calculator does not have a π button, take the value of π to be 3.142 unless the question instructs otherwise.



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.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end.

Turn over ►

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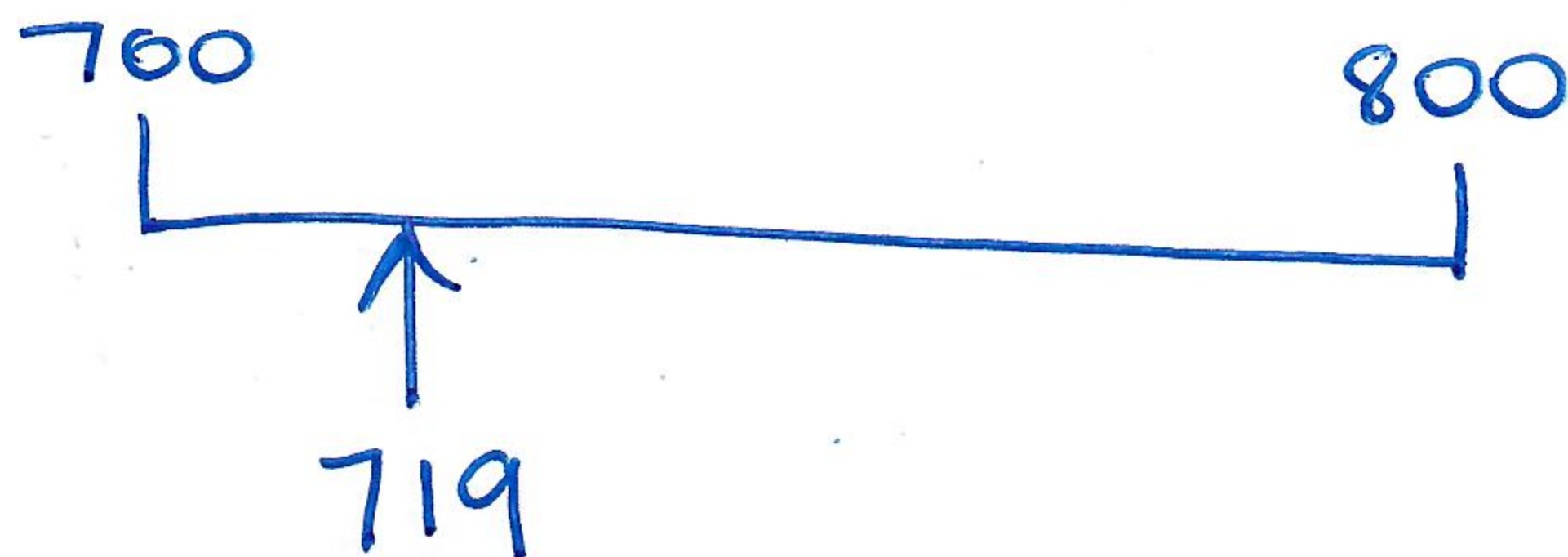

Pearson

Answer ALL questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

1 Write 719 to the nearest hundred.



Five or more goes up.
 $1 < 5$ so down to
700

(Total for Question 1 is 1 mark)

2 Write down a multiple of 8 that is between 41 and 60

8 16 24 32 40 48 56 64

48 or 56

(Total for Question 2 is 1 mark)

3 Change 2.41 kilometres to metres.

$$2.41 \times 1000 = 2410 \text{ m}$$

↑
1000 m in 1 km

2410 metres

(Total for Question 3 is 1 mark)

4 Here is a list of numbers.

1 4 8 12 16 27 32 64

From the list, write down all the numbers that are powers of 4

$$4^0 = 1 \quad 4^2 = 16$$
$$4^1 = 4 \quad 4^3 = 64$$

1, 4, 16, 64

(Total for Question 4 is 1 mark)

5 Write 48% as a fraction.

$\frac{48}{100}$

(Total for Question 5 is 1 mark)

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6 Work out 40% of 240

$$\frac{40}{100} \times 240 = 4 \times 24 = 96$$

96

(Total for Question 6 is 2 marks)

7 There are four types of counter in a bag.

The table shows the number of each type of counter in the bag.

Type of counter	red circle	green circle	red square	green square
Number of counters	43	67	23	71

There are more green counters than red counters.

How many more?

$$43 + 23 = 66$$

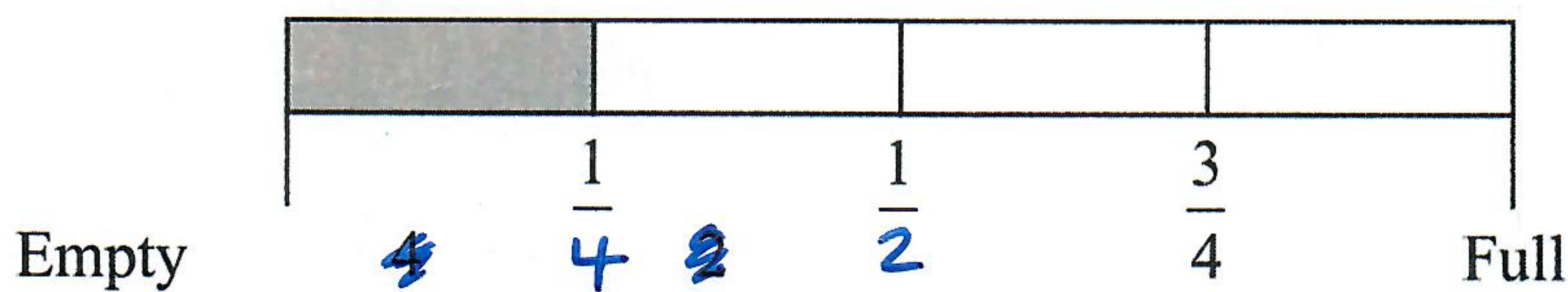
$$138 - 66 = 72$$

$$67 + 71 = 138$$

72

(Total for Question 7 is 2 marks)

8 Here is the gauge for the fuel tank of a car.



The fuel tank holds 84 litres of fuel when the tank is full.

The tank is $\frac{1}{4}$ full of fuel.

Work out how many more litres of fuel are needed to fill the tank.

$$\frac{3}{4} \times 84 = 3 \times 21 = 63 \text{ l}$$

63 litres

(Total for Question 8 is 3 marks)



9 Simplify $16d + 7e - 9d + e$

$$16d - 9d + 7e + e = 7d + 8e$$

$$\underline{7d + 8e}$$

(Total for Question 9 is 2 marks)

10 Bill has 600 counters in a bag.

He gives

82 of the counters to Sameena

58 of the counters to Henry

95 of the counters to Lucas

What fraction of the 600 counters is left in Bill's bag? Give your fraction in its simplest form.

$$82 + 58 + 95 = 235$$

$$600 - 235 = 365$$

$$\frac{365}{600} = \frac{73}{120}$$

$$\underline{\frac{73}{120}}$$

(Total for Question 10 is 3 marks)

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11 The table shows the costs of sending a parcel by the Express service and by the Rapid service.

Type of service	Cost
Express	£19.45
Rapid	£37.38

Brendan has to send 8 parcels.
It will be cheaper to send the parcels by the Express service than by the Rapid service.

(a) How much cheaper?

$$8 \times 37.38 = 299.04$$

$$8 \times 19.45 = 155.60 \leftarrow \text{Note two digits behind point for money.}$$

$$299.04 - 155.60 = 143.44$$

£ 143.44
(3)

Luke wants to send 26 parcels by the Express service.
He does the calculation $25 \times £20 = £500$ to estimate the cost.

(b) Explain why Luke's calculation shows the actual cost will be less than £500.

Because rounded the £19.45 up to £20 which means his result will be $25 \times 0.55 = £13.75$ higher than the actual cost of postage.
(1)

(Total for Question 11 is 4 marks)



12 Ali, Ben and Cathy share an amount of money in the ratio 9 : 21 : 14

What fraction of the money does Ben get?

$$A: \frac{9}{9+21+14} = \frac{9}{44}$$

$$\text{Ben: } \frac{21}{44} \quad C: \frac{14}{44}$$

$$\frac{21}{44}$$

(Total for Question 12 is 2 marks)

13 The first term of a sequence of numbers is 31
The term-to-term rule of this sequence is 'add 7'

Josie says,

"No number in this sequence is in the 5 times table."

(a) Give an example to show that Josie is wrong.

$$31 + 7 = 38$$
$$38 + 7 = 45$$

$$45$$

(1)

(b) Is 66 a number in this sequence?
Give a reason for your answer.

Yes because $31 + 35 = 66$ and 35 is in
the seven times table.

(1)

(Total for Question 13 is 2 marks)



14 Find the value of $\frac{201.53 + 9.73}{18.71 - 5.19}$

Give your answer as a decimal.

Write down all the figures on your calculator display.

$$201.53 + 9.73 = 211.26$$

$$18.71 - 5.19 = 13.52$$

$$211.26 \div 13.52 =$$

15.62573964

(Total for Question 14 is 2 marks)

- 15 You can use this rule to work out the total hire charge, in pounds (£), for hiring a 3D printer for a number of days.

$$\text{Total hire charge (£)} = \text{number of days} \times 8.55 + 52$$

Mia wants to hire a 3D printer for 7 weeks.

(a) Work out the total hire charge.

$$7 \times 7 = 49 \text{ days.}$$

$$49 \times 8.55 = 418.95$$

$$418.95 + 52 = 470.95$$

£ 470.95
(2)

Zahir hires a 3D printer.

The total hire charge is £223.00

(b) For how many days does Zahir hire the 3D printer?

$$223 - 52 = 171$$

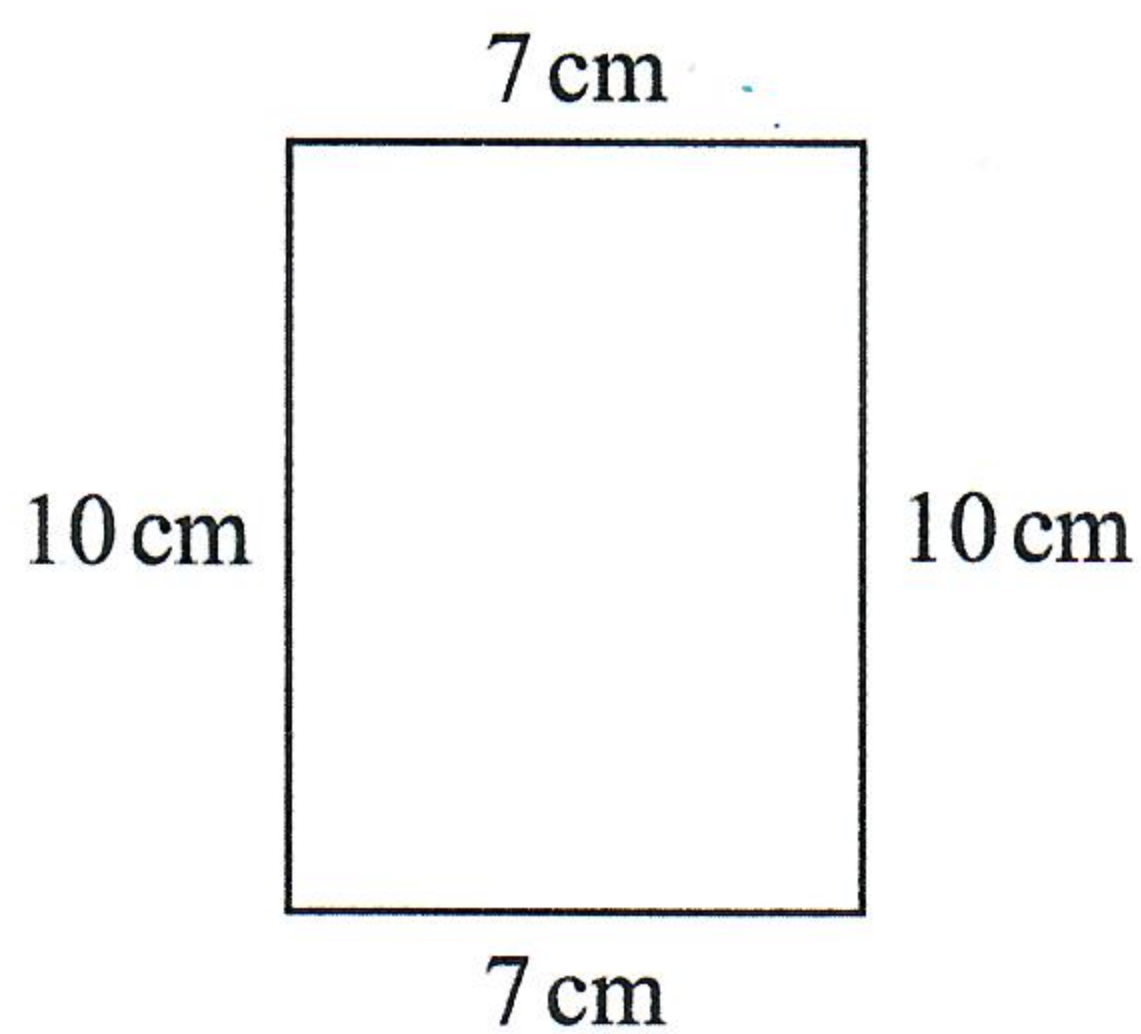
$$171 \div 8.55 = 20$$

20 days
weeks
(2)

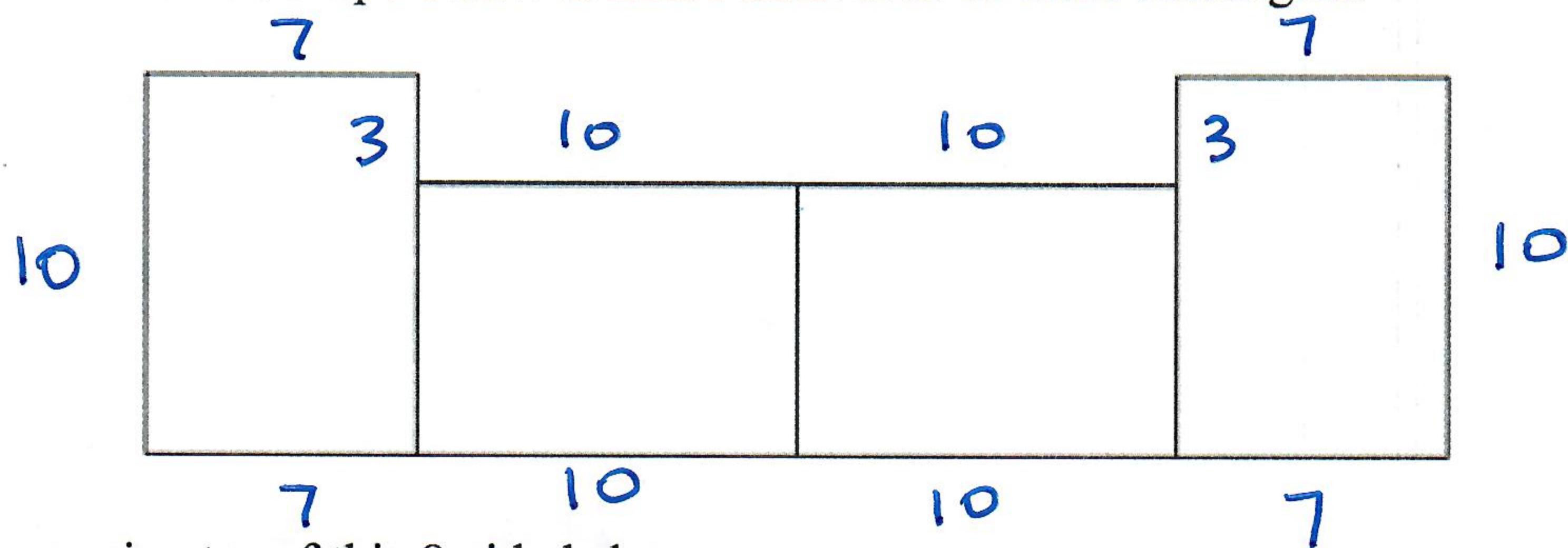
(Total for Question 15 is 4 marks)



16 Here is a rectangle.



The 8-sided shape below is made from four of these rectangles.



Work out the perimeter of this 8-sided shape.

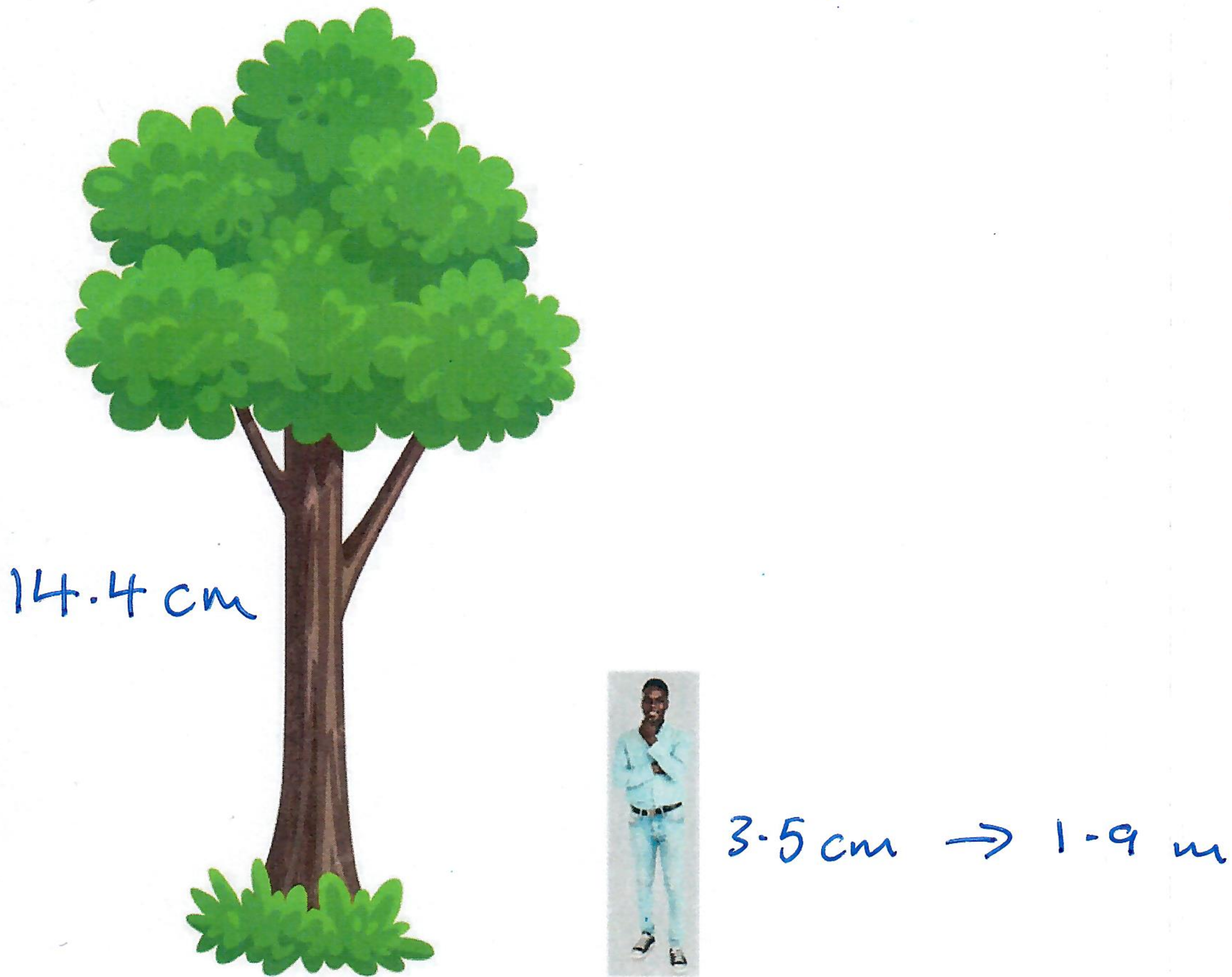
$$10 + 7 + 3 + 10 + 10 + 3 + 7 + 10 + 7 + 10 + 10 + 7 = 94$$

94 cm

(Total for Question 16 is 3 marks)



17 The accurate scale diagram shows a tree and a man.



The man has a height of 1.9 metres.

Find an estimate for the real height, in metres, of the tree.

$$\frac{14.4}{3.5} \times 1.9 = 7.817142857 \text{ m}$$

$$\approx 7.82 \text{ m}$$

..... 7.82 metres

(Total for Question 17 is 2 marks)



18 The table shows information about the numbers of points scored by 30 students in a quiz.

Number of points	Frequency
0	4
1	8
2	5
3	7
4	4
5	2

mode = highest frequency

(a) Find the modal number of points.

modal number of points is 1

1

(1)

(b) Work out the total number of points scored.

$$(4 \times 0) + (8 \times 1) + (5 \times 2) + (7 \times 3) + (4 \times 4) + (5 \times 2) =$$
$$0 + 8 + 10 + 21 + 16 + 10 = 65$$

65

(2)

(Total for Question 18 is 3 marks)

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19 Make x the subject of the formula $y = 9x - 3$

$$\begin{aligned} & y = 9x - 3 \\ +3 \quad \hookrightarrow & \quad y + 3 = 9x \quad \hookrightarrow +3 \\ \div 9 \quad \hookrightarrow & \quad \frac{y+3}{9} = x \quad \hookrightarrow \div 9 \end{aligned}$$

$$\therefore x = \frac{y+3}{9}$$

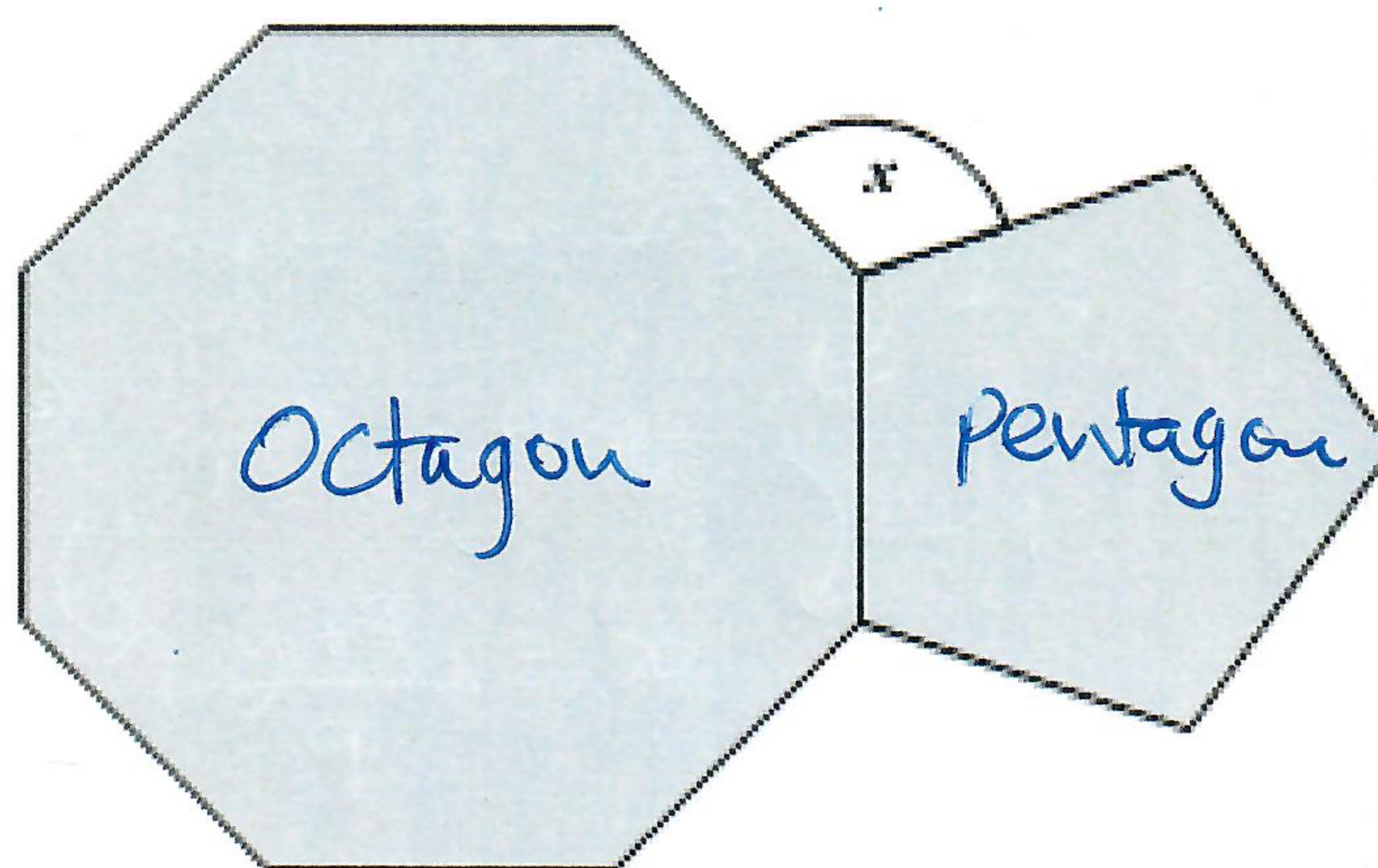
Subject always
goes on the left

$$x = \frac{y+3}{9}$$

(Total for Question 19 is 2 marks)



20 The diagram shows two regular shapes.



Work out the size of angle x .

$$\frac{360}{8} = 45 \quad x = 72 + 45 = 117^\circ$$

$$\frac{360}{5} = 72$$

..... 117 °

(Total for Question 20 is 2 marks)

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21 Liz goes on holiday to South Africa.

Liz wants to change £1600 into South African rand.
She wants to get as many 200 rand notes as possible.

The exchange rate is £1 = 21.34 rand.

Work out the greatest number of 200 rand notes that Liz can get for £1600

$$1600 \times 21.34 = 34144$$

$$34144 \div 200 = 170.72$$

So Liz could get 170 200 rand notes

170

(Total for Question 21 is 3 marks)

22 In October Sally drove 670 miles in her car.

The car travelled 43.5 miles for each gallon of petrol used.

Petrol cost £1.38 per litre.

1 gallon = 4.55 litres.

Work out the cost of the petrol the car used in October.

$$670 \div 43.5 = 15.40229885 \text{ gallons}$$

$$15.40229885 \times 4.55 = 70.08045977 \text{ litres}$$

$$70.08045977 \times 1.38 = \text{£}96.71103448$$

$$\approx \text{£}96.71$$

£ 96.71

(Total for Question 22 is 4 marks)



23 Costcorp sells packets of sweets to shop owners.

On Monday three shop owners buy sweets from Costcorp.

Each shop owner buys small packets, medium packets and large packets of mints.

Alan buys 250 packets of sweets.

32% are small packets.

40% are large packets.

Beryl buys 500 packets of sweets.

$\frac{3}{10}$ are small packets.

$\frac{1}{10}$ are large packets.

Charlie buys 250 small packets of sweets so that

number of small packets : number of medium packets = 5 : 6

Work out the total number of medium packets of sweets these shop owners buy.

You must show all your working.

Alan

$$100 - (32 + 40) = 100 - 72 = 28\%$$

$$\frac{28}{100} \times 250 = 70 \text{ medium packets.}$$

Beryl

$$1 - \left(\frac{3}{10} + \frac{1}{10}\right) = 1 - \frac{4}{10} = \frac{6}{10}$$

$$\frac{6}{10} \times 500 = 300 \text{ medium packets}$$

Charlie

$$250 \div 5 = 50 \text{ (value of one part).}$$

$$6 \times 50 = 300 \text{ medium packets}$$

Total

$$70 + 300 + 300 = 670 \text{ medium packets}$$

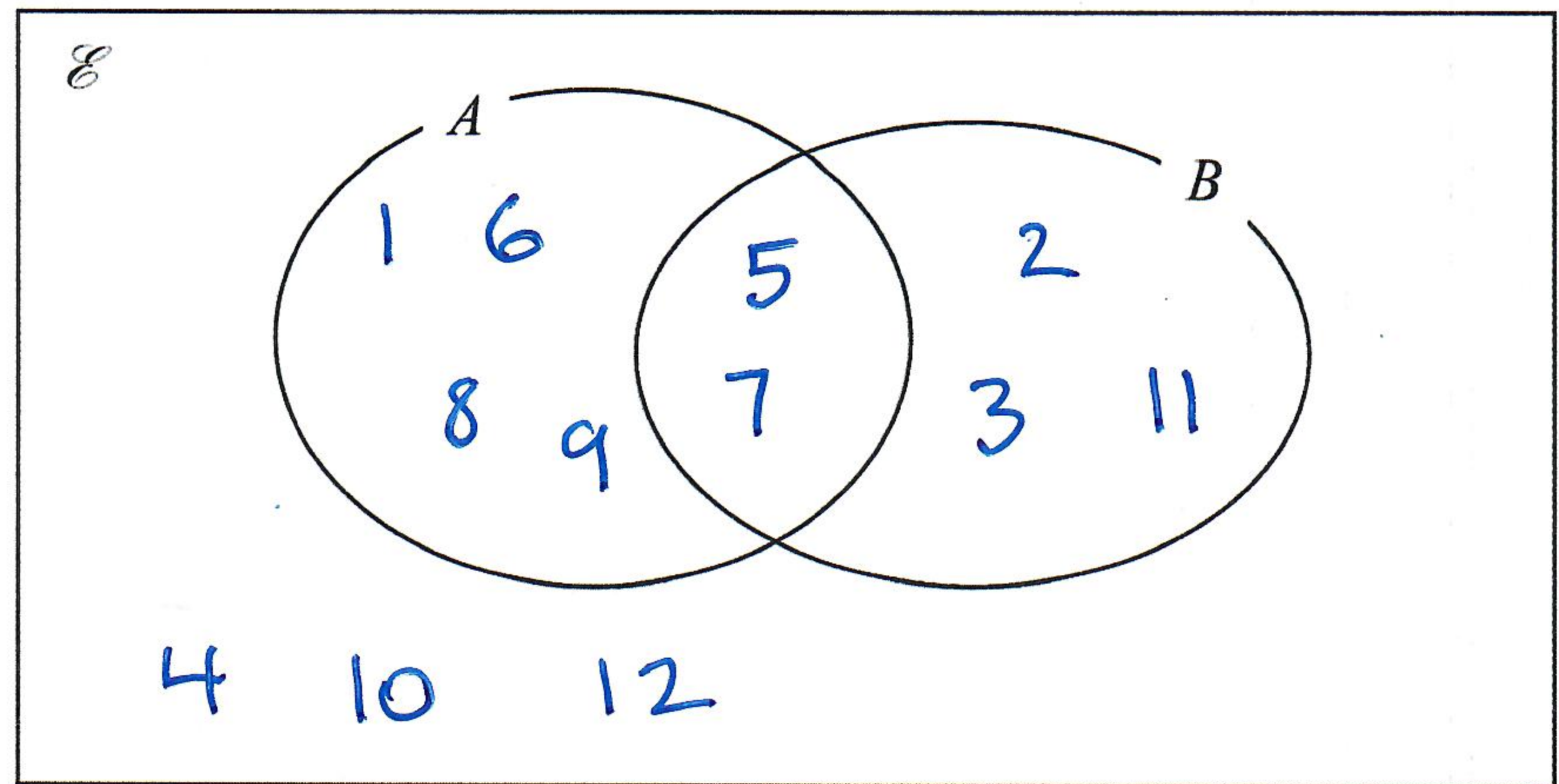
..... 670

(Total for Question 23 is 5 marks)



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24 $\mathcal{E} = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12\}$
 $A = \{1, 5, 6, 7, 8, 9\}$
 $B = \{2, 3, 5, 7, 11\}$



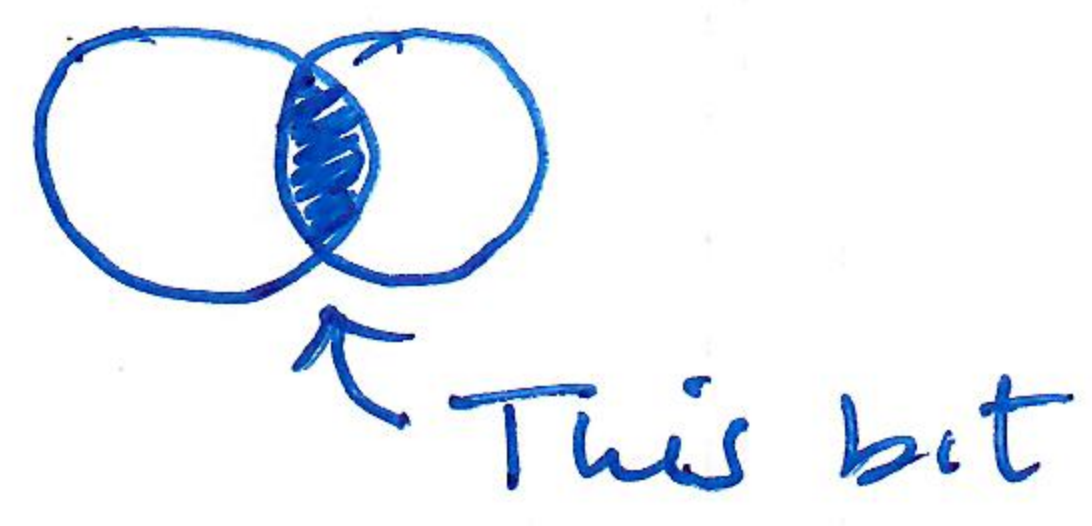
(a) Complete the Venn diagram to represent this information.

(3)

A number is chosen at random from the universal set \mathcal{E} .

(b) Find the probability that the number is in the set $A \cap B$

$A \cap B$ means A and B



$$\frac{2}{12} = \frac{1}{6}$$

$\frac{1}{6}$
 (2)

(Total for Question 24 is 5 marks)

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- 25 Katy invests £200 000 in a savings account for 6 years.
The account pays compound interest at a rate of 4.2% per annum.

Calculate the total amount of interest Katy will get at the end of 6 years.

$$\begin{aligned} PR^T &= 200\,000 \times 1.042^6 \\ &= 255\,997.845 \\ \text{Interest} &= \pounds 55,997.845 \end{aligned}$$

To 2 d.p. £ 55,997.85

(Total for Question 25 is 3 marks)

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26 The table shows information about the heights of 70 plants.

Midpoint $\frac{10+20}{2} = 15$	Height (h cm)	Frequency	Cumulative Frequency
	$10 < h \leq 20$	16	16
25	$20 < h \leq 30$	13	29
35	$30 < h \leq 40$	9	38
45	$40 < h \leq 50$	17	55
55	$50 < h \leq 60$	11	66
65	$60 < h \leq 70$	4	70

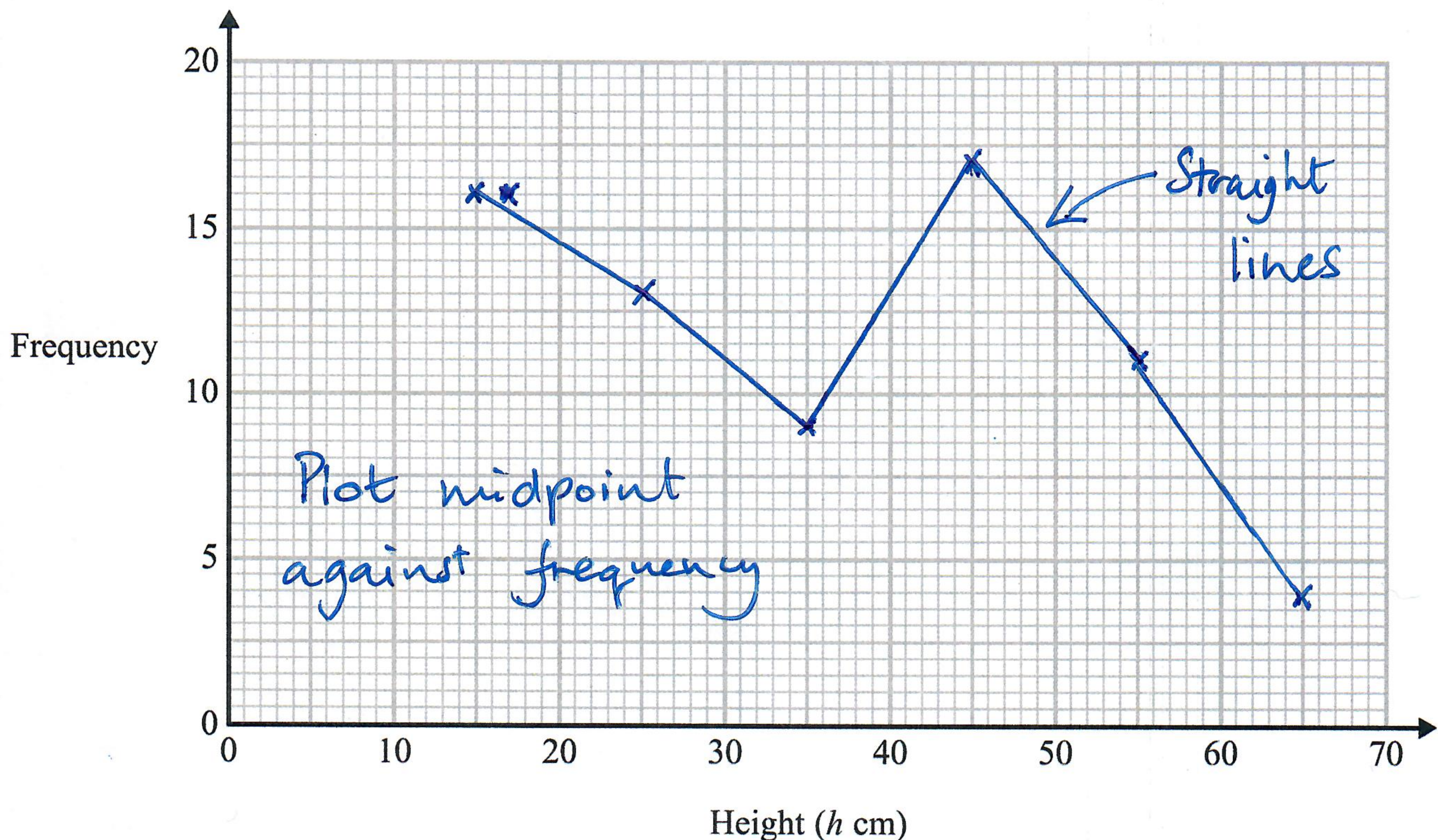
(a) Find the class interval that contains the median.

$$\frac{70}{2} = 35$$

$$30 < h \leq 40$$

So we are looking for the 35th & 36th positions. (1)

(b) On the grid, draw a frequency polygon for the information in the table.

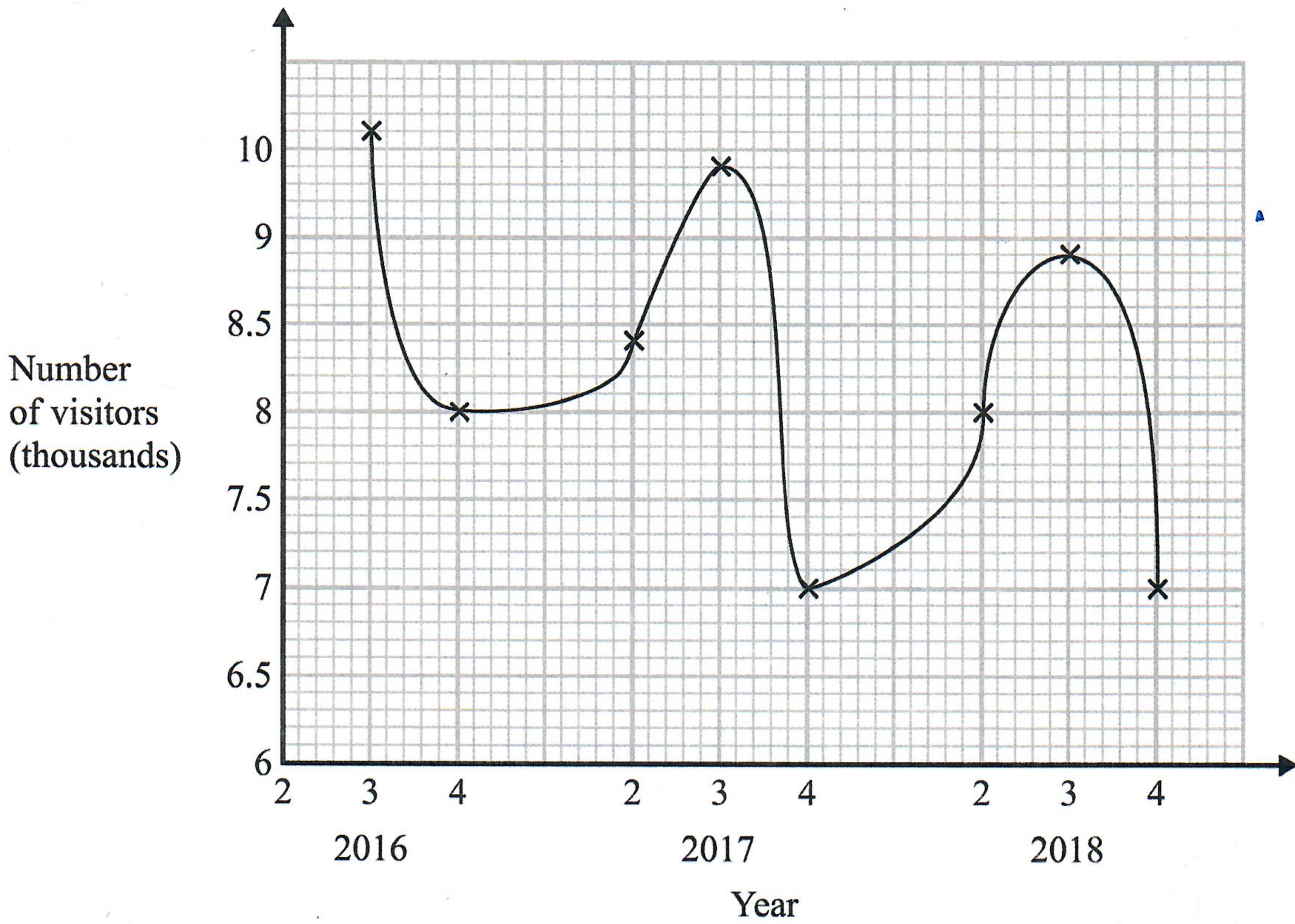


(2)

(Total for Question 26 is 3 marks)



27 Sean has drawn a time series graph to show the numbers, in thousands, of visitors to a fun park.



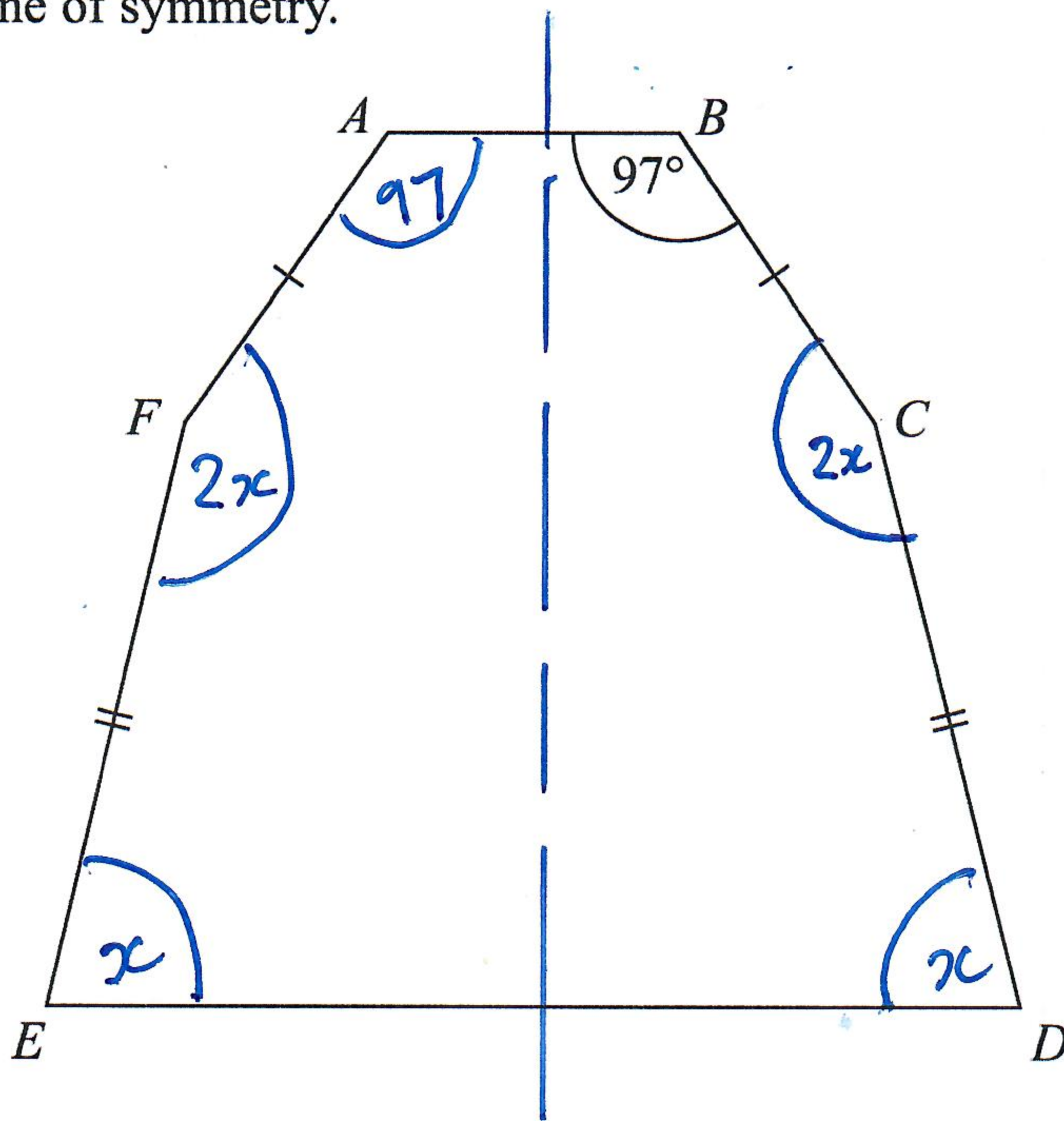
Write down two things that are wrong or could be misleading with this graph.

- 1 The y-axis is uneven as there is no 9.5 shown and instead 10 is in its place.
- 2 The lines should be straight ones, joining each point to the next.

(Total for Question 27 is 2 marks)



- 28 The diagram shows a hexagon.
The hexagon has one line of symmetry.



$$FA = BC$$

$$EF = CD$$

$$\text{Angle } ABC = 97^\circ$$

$$\text{Angle } BCD = 2 \times \text{angle } CDE$$

Work out the size of angle AFE .

You must show all your working.

$FAB = 97^\circ$ Because $ABCDEF$ is symmetrical

Interior angles in a hexagon = $180(6-2)$
 $= 720^\circ$

$$\therefore x + 2x + x + 2x + 97 + 97 = 720^\circ$$

$$\begin{array}{r} 6x + 194 = 720 \\ -194 \\ \hline 6x = 526 \\ \div 6 \\ \hline x = 87\frac{2}{3} \end{array}$$

$$AFE = 2x = 87\frac{2}{3} \times 2 = 175\frac{1}{3}^\circ$$

$$175\frac{1}{3}^\circ$$

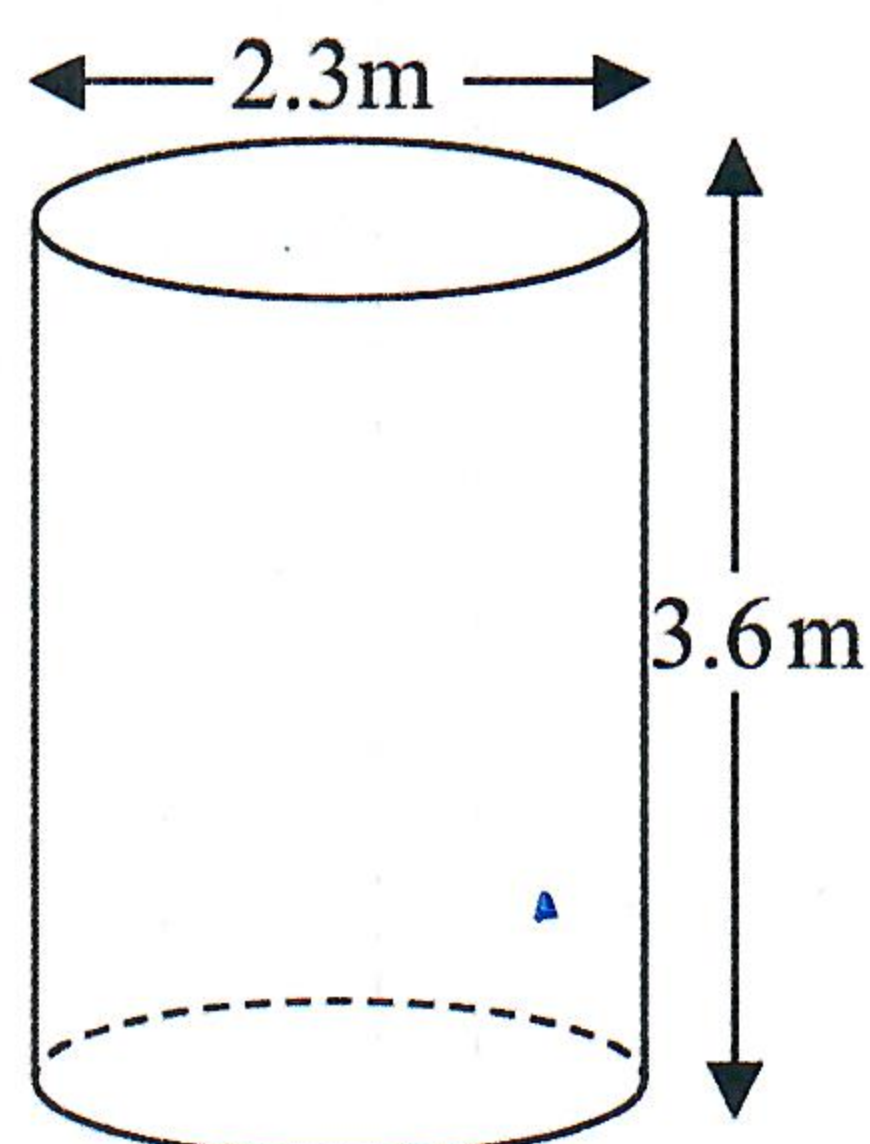
(Total for Question 28 is 4 marks)

29 Jeremy has to cover 5 tanks completely with paint.

Each tank is in the shape of a cylinder with a top and a bottom.
The tank has a diameter of 2.3 m and a height of 3.6 m.

Jeremy has ¹³9 tins of paint.
Each tin of paint covers 11 m^2

Has Jeremy got enough paint to cover completely the 5 tanks?
You must show how you get your answer.



For 1 tank

$$\text{Sides} = 2.3 \times \pi \times 3.6 = 8.28 \pi \text{ m}^2$$

$$\text{Top + Bottom} = (\pi \times 1.15 \times 1.15) \times 2$$

$$= 1.3225 \pi \times 2$$

$$= 2.645 \pi \text{ m}^2$$

$$\therefore \text{Total paint for one tank} = (8.28 + 2.645) \pi$$
$$= 10.925 \pi \text{ m}^2$$

For 5 tanks

$$5 \times 10.925 \pi = 54.625 \pi$$

$$\approx 171.60949807 \text{ m}^2$$

Paint coverage

$$13 \times 11 = 143 \text{ m}^2 < 171.60949807 \text{ m}^2$$

So Jeremy does not have enough paint.

(Total for Question 29 is 5 marks)



30 Solve the simultaneous equations

$$3x - 4y = 13 \quad \text{--- (i)}$$

$$4x + 2y = 32 \quad \text{--- (ii)}$$

Multiply (ii) $\times 2$

$$8x + 4y = 64 \quad \text{--- (iii)}$$

Add (i) + (iii)

$$11x = 77$$

$$\therefore x = 7$$

Substitute in (ii)

$$4(7) + 2y = 32$$

$$28 + 2y = 32$$

$$\therefore 2y = 32 - 28$$
$$= 4$$

$$\therefore y = 2$$

Check in (i)

$$3x - 4y = 13$$

$$3(7) - 4(2) = 13$$

$$21 - 8 = 13 \quad \checkmark$$

$$x = \dots\dots\dots 7$$

$$y = \dots\dots\dots 2$$

(Total for Question 30 is 3 marks)

TOTAL FOR PAPER IS 80 MARKS

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