

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)

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Tuesday 21 May 2019

Morning (Time: 1 hour 30 minutes)

Paper Reference **1MA1/1F**

Mathematics Shadow Paper A

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 240 minutes in hours.

$$\frac{240}{60} = 4$$

4

..... hours

(Total for Question 1 is 1 mark)

- 2 Write 0.38 as a percentage.

$$0.38 \times 100 = 38\%$$

38

..... %

(Total for Question 2 is 1 mark)

- 3 Work out $10 \times (3 + 7)$

$$= 10 \times 10$$

$$= 100$$

100

.....

(Total for Question 3 is 1 mark)

- 4 Write down a prime number that is between 30 and 40

~~30~~ (31) ~~32~~ ~~33~~ 34 ~~35~~ 36 (37) 38 ~~39~~ 40

✓ Two times table

✗ Three times table

≠ Five times table

○ Prime numbers

37

.....

(Total for Question 4 is 1 mark)



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5 Find the number that is exactly halfway between 9 and 21

$$\frac{9 + 21}{2} = \frac{30}{2} = 15$$

15

(Total for Question 5 is 1 mark)

6 Harry is planning a holiday for 3 people for 7 days.

Here are the costs for the holiday for each person.

Travel	£160
Hotel	£60 for each day
Spending money	£250

Work out the total cost of the holiday for 3 people for 7 days.

Hotel

$$3 \times 7 = 21$$

$$21 \times 60 = 1260$$

Travel

$$3 \times 160 = 480$$

Spending money

$$3 \times 250 = 750$$

Total Cost

$$\begin{array}{r}
 1260 \\
 480 + \\
 \hline
 750 \\
 \hline
 2490
 \end{array}$$

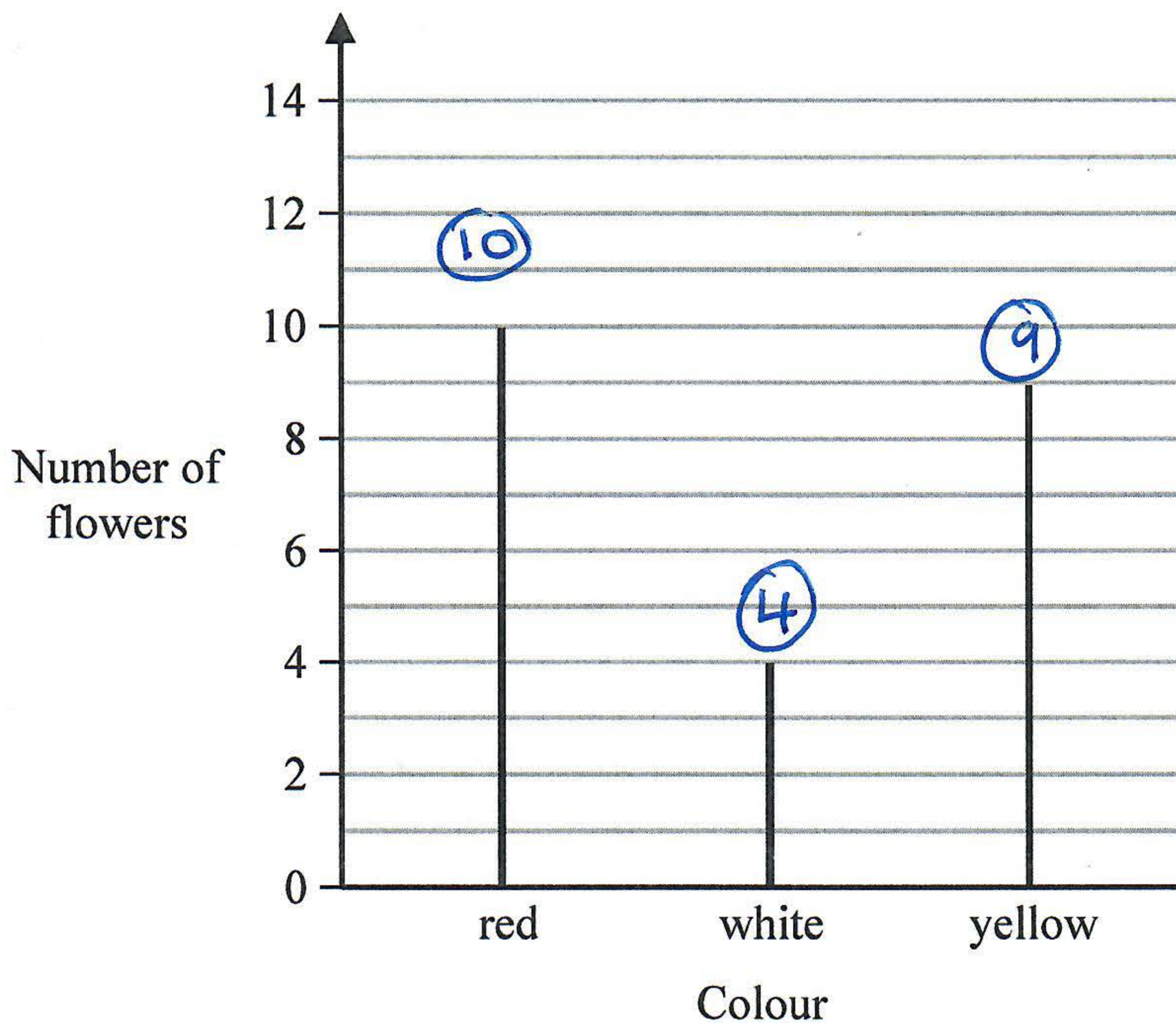
£ 2490

(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.

$$30 - (10 + 4 + 9) = 30 - 23 = 7 \text{ blue flowers}$$

7

(2)

(b) Write down the mode.

The most abundant colour is red with 10 flowers

~~red~~ red

(1)

(Total for Question 7 is 3 marks)



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

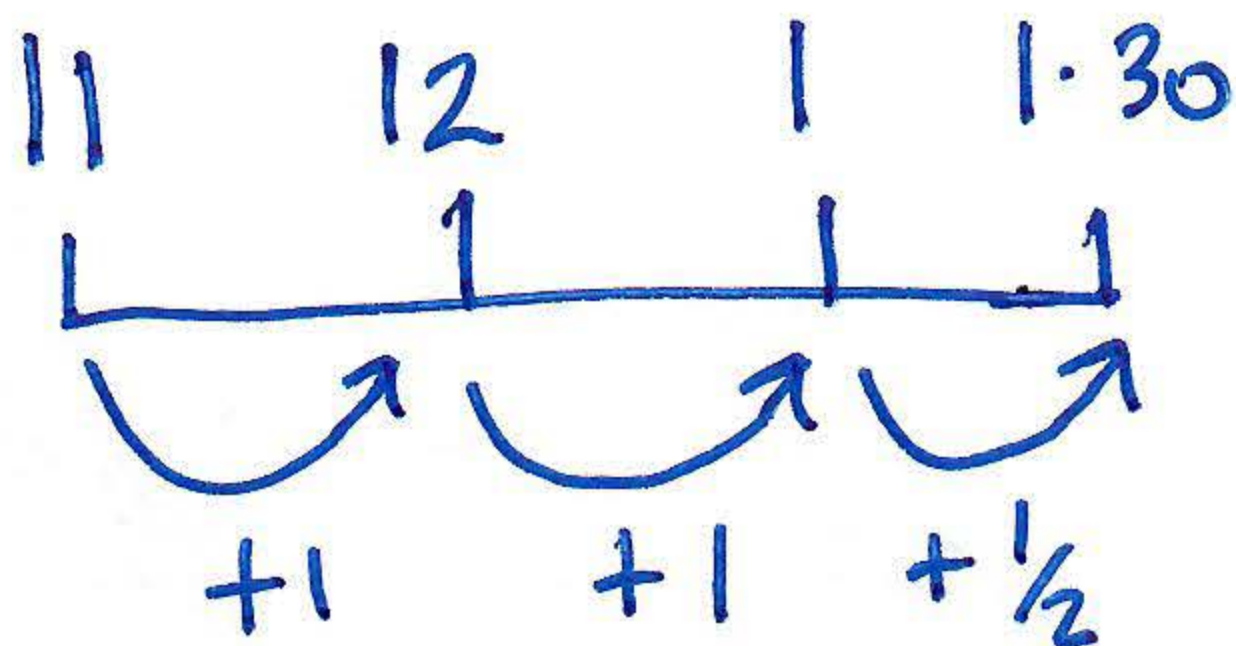
$$\frac{1}{5} \quad \frac{3}{4} \quad \frac{1}{4} \quad \frac{7}{10} \quad \frac{1}{3}$$

$$\frac{1}{5} \quad \frac{1}{4} \quad \frac{1}{3} \quad \frac{7}{10} \quad \frac{3}{4}$$

(Total for Question 8 is 2 marks)

- 9 Ruth left her home at 11 am and walked to the library.
She got to the library at 1:30 pm. Ruth
walked at a speed of 3 mph.

- (a) Work out the distance Ruth walked.



$2\frac{1}{2}$ hours

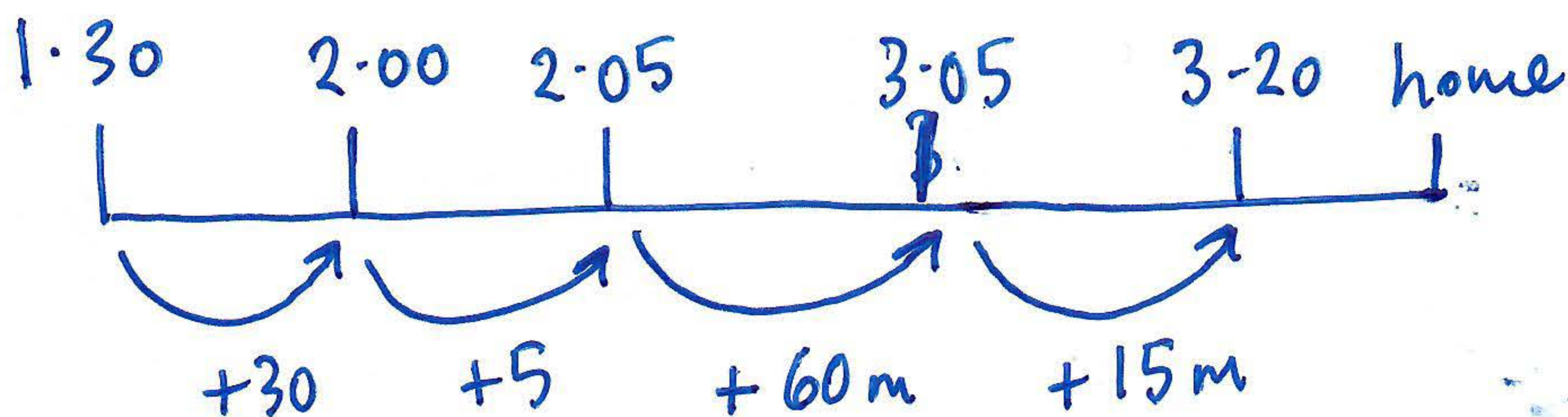
$$\begin{array}{r} 2.5 \\ 3 \times \\ \hline 7.5 \end{array}$$

7.5 miles
(2)

Ruth got to the library at 1:30 pm. She
stayed at the library for 35 minutes.
Then she walked home.

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

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



$3:20$ pm
(2)

(Total for Question 9 is 4 marks)



10 (a) Solve $t + t + t = 18$

$$\begin{array}{l} \div 3 \quad \hookrightarrow \quad 3t = 18 \quad \hookrightarrow \div 3 \\ \quad \quad \quad \quad t = 6 \end{array}$$

$$t = \underline{\quad 6 \quad} \quad (1)$$

(b) Solve $x - 3 = 9$

$$\begin{array}{l} +3 \quad \hookrightarrow \quad x - 3 = 9 \quad \hookrightarrow +3 \\ \quad \quad \quad \quad x = 12 \end{array}$$

$$x = \underline{\quad 12 \quad} \quad (1)$$

(c) Solve $7w + 2 = 23$

$$\begin{array}{l} -2 \quad \hookrightarrow \quad 7w + 2 = 23 \quad \hookrightarrow -2 \\ \quad \quad \quad \quad 7w = 21 \quad \hookrightarrow \div 7 \\ \div 7 \quad \hookrightarrow \quad w = 3 \end{array}$$

$$w = \underline{\quad 3 \quad} \quad (2)$$

(Total for Question 10 is 4 marks)

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11 Work out 79×38

$$\begin{array}{r} 79 \\ 38 \times \\ \hline 632 \\ 2370 \\ \hline 3002 \end{array}$$

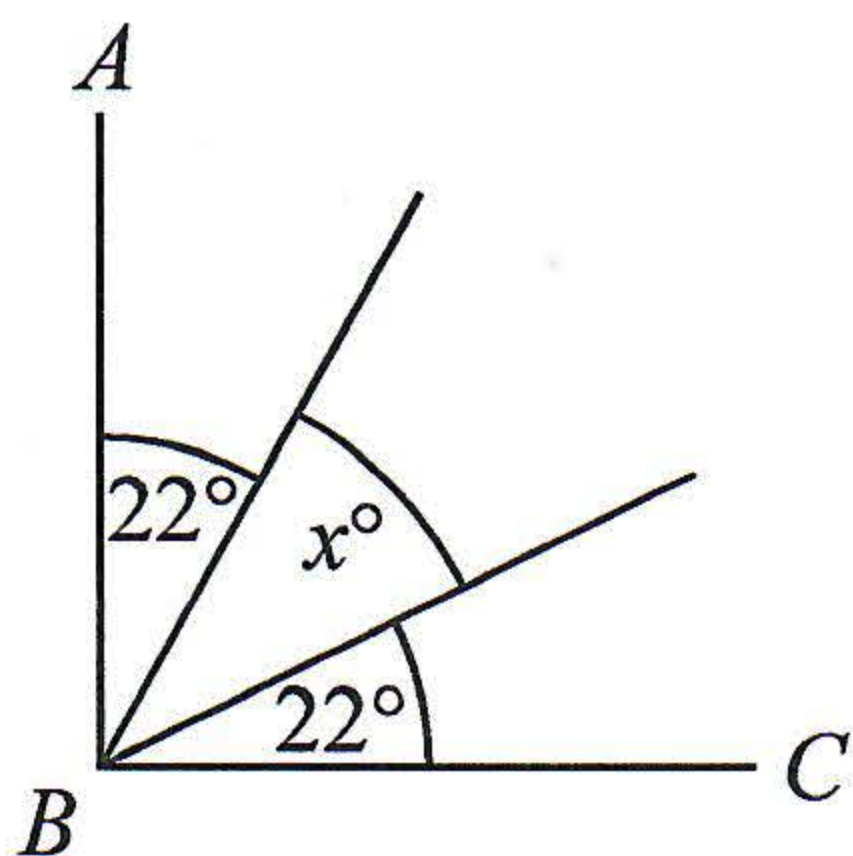
← Remember your zero.

3002

(Total for Question 11 is 2 marks)



12 AB and BC are perpendicular lines.

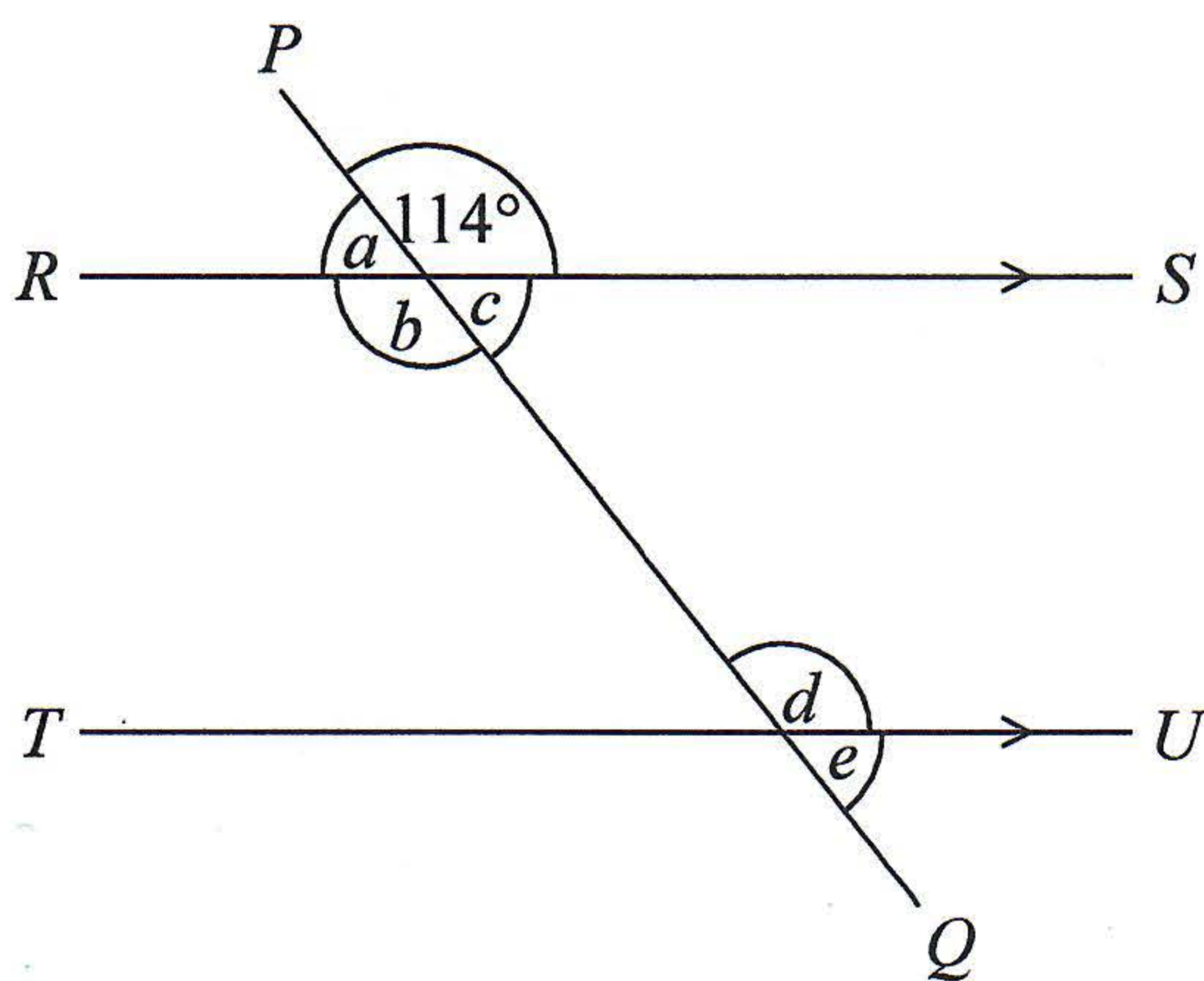


(a) Find the value of x .

$$x = 90 - 22 - 22 = 46$$

$$x = 46^\circ \quad (2)$$

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



An angle of size 114° is shown on the diagram.

(b) (i) Write down the letter of one other angle of size 114°
 Give a reason for your answer.

b (Vertically opposite)

(2)

(ii) Explain why $a + b + c = 246^\circ$

$$a + b + c + 114 = 360 \quad (\text{Angles about a point total } 360)$$

$$\therefore a + b + c = 360 - 114$$

$$= 246^\circ$$

(1)

(Total for Question 12 is 5 marks)



13 The length of a line is x 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 the line will be

10x mm

(Total for Question 13 is 1 mark)

14 (a) Work out $\frac{1}{5}$ of 90

$$\frac{1}{5} \times \frac{90}{1} = 18$$

18

(1)

Fiona had to work out $64 \div \frac{1}{2}$

$$64 \div \frac{1}{2} = 32$$

Fiona's reason is,

"There are 2 halves in 1, so there will be 24 halves in 48"

(b) Explain what is wrong with Fiona's reason.

$$\frac{64}{1} \div \frac{1}{2} = \frac{64}{1} \times \frac{2}{1} = 128$$

Fiona forgot to flip the $\frac{1}{2}$ to change the division to a multiplication. (1)

(Total for Question 14 is 2 marks)



15 (a) Write down the value of $\sqrt{81} = 9 \because 9 \times 9 = 81$

9

(1)

(b) Work out the value of 4^3

$$4 \times 4 \times 4 = 64$$

64

(1)

(Total for Question 15 is 2 marks)

16 (a) Expand $3(6m - 5) = 18m - 15$

18m - 15

(1)

(b) Factorise $8n + 24$

$$8(n + 3)$$

8(n + 3)

(1)

(Total for Question 16 is 2 marks)

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17 Stuart throws a biased coin 10 times.
He gets 7 Tails.

Maxine throws the same coin 80 times.
She gets 53 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 Maxine's?
You must give a reason for your answer.

Maxine's results will be better because her results are based on 80 throws as opposed to 10.

(1)

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

$$\frac{7 + 53}{10 + 80} = \frac{60}{90} = \frac{6}{9} = \frac{2}{3} \approx 0.6\bar{6}$$

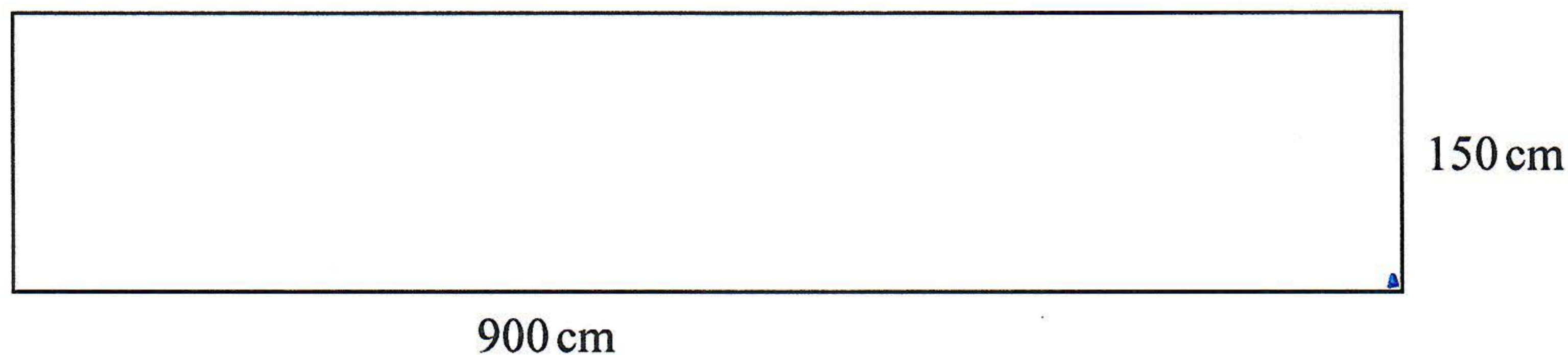
0.6̄

(1)

(Total for Question 17 is 2 marks)



18 The diagram shows a rectangular garden path.

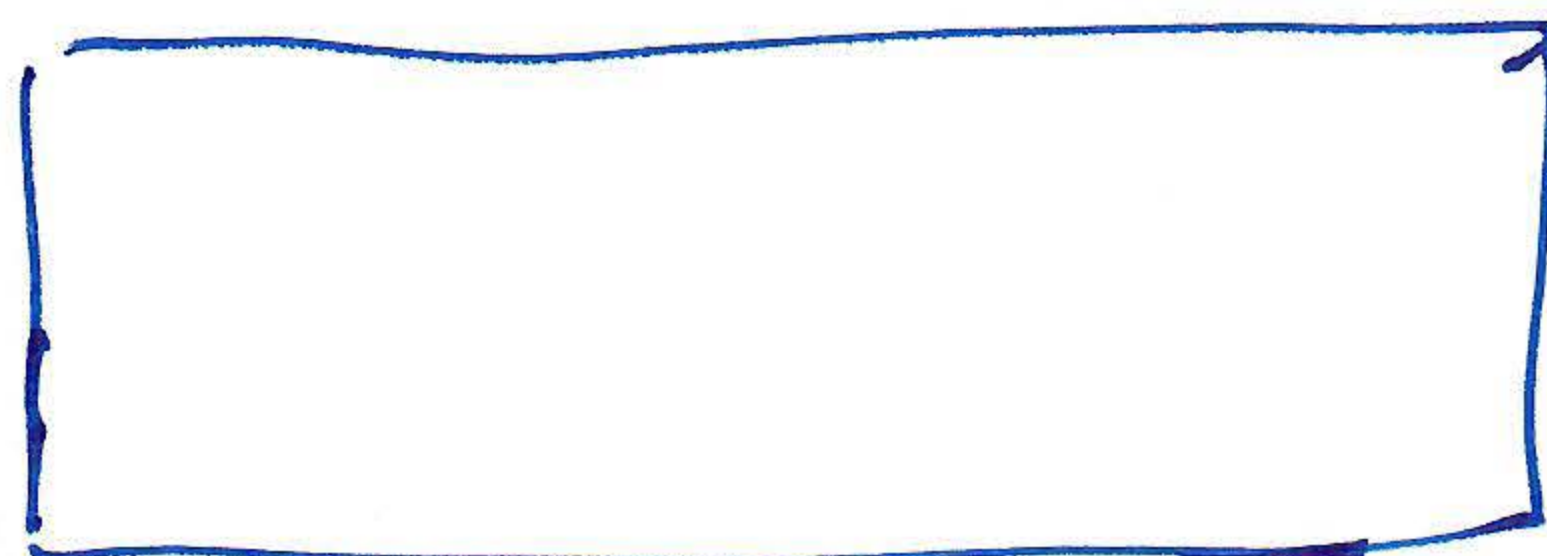


Wasim is going to cover the path with paving stones.
Each paving stone is a square of side 30 cm.
Each paving stone costs £2.50

Wasim has £320 to spend on paving stones.

Show that he has enough money to buy all the paving stones he needs.

$$900 \div 30 = 30$$



$$150 \div 30 = 5$$

30 paving stones \times 5 paving stones
= 150 paving stones.

$$\begin{array}{r} 150 \\ 2.50 \times \\ \hline 0 \\ 7500 \\ 30000 \\ \hline 375.00 \end{array}$$

Cost is £375.00

So Wasim does not have
enough money.

(Total for Question 18 is 4 marks)



19 (a) Work out $\frac{2}{3} - \frac{1}{8}$

$$\underline{\times} \quad \frac{a}{b} - \frac{c}{d} = \frac{ad - bc}{bd}$$

$$\frac{2}{3} - \frac{1}{8} = \frac{(2 \times 8) - (3 \times 1)}{(3 \times 8)} = \frac{16 - 3}{24} = \frac{13}{24}$$

$$\frac{13}{24}$$

(2)

(b) Work out $\frac{2}{3} \times \frac{3}{10}$

Give your answer as a fraction in its simplest form.

$$\frac{\cancel{2}^1}{\cancel{3}_1} \times \frac{\cancel{3}^1}{5} = \frac{1}{5}$$

Divide by 3 Divide by 2

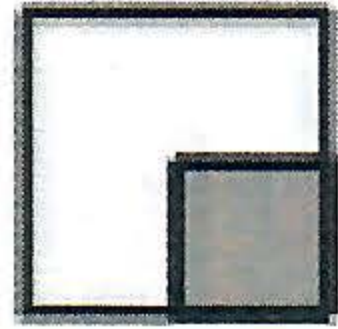
$$\frac{1}{5}$$

(2)

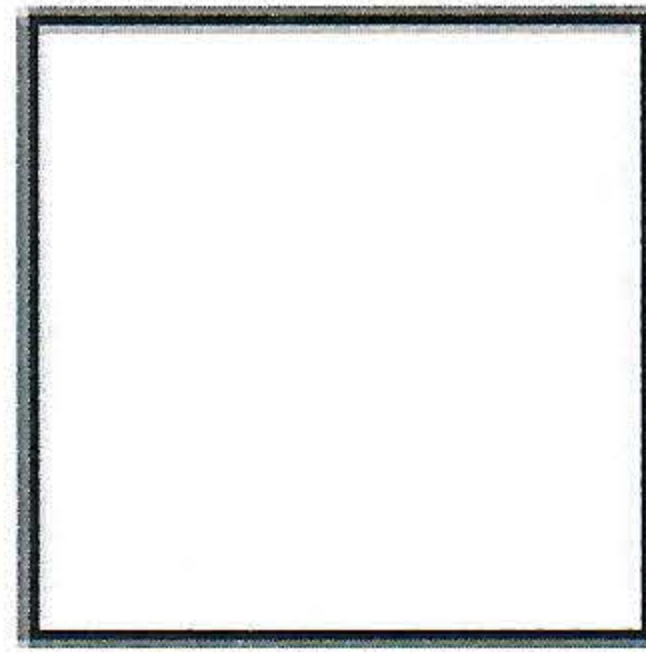
(Total for Question 19 is 4 marks)



20 Here are two squares, A and B.



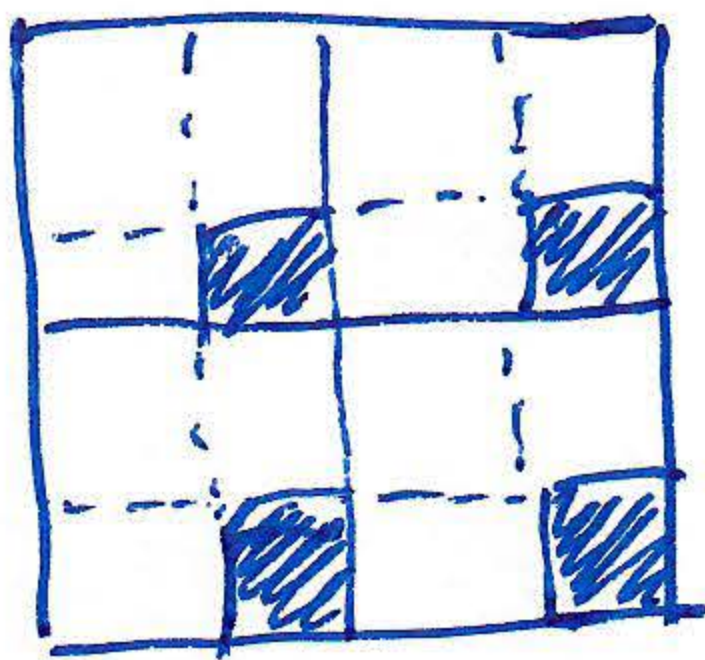
A



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.



$$\frac{1}{4} \times \frac{1}{4} = \frac{1}{16}$$

$$\frac{4}{16} = \frac{1}{4} = 25\%$$

25 %

(Total for Question 20 is 3 marks)

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21 There are 38 students in a class.

Each student walks to school or cycles to school or gets the bus to school.

There are 18 girls in the class.

9 of the girls walk to school.

7 of the boys cycle to school.

6 of the 10 students who get the bus to school are boys.

Find the number of these students who walk to school.

	Walk	Cycle	Bus	Total
Boys	$20 - (7+6)$ $= 7$	7	6	$38 - 18 = 20$
Girls	9	$12 - 7 = 5$	$10 - 6 = 4$	18
Total	$7 + 9 = 16$	$38 - (16+10)$ $= 12$	10	38

16 students walk to school.

16.

(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	0.3	0.3

The number of red cubes in the box is the same as the number of yellow cubes in the box.

(a) Complete the table.

$$1 - 0.4 = 0.6$$

$$\frac{0.6}{2} = 0.3$$

(2)

There are 20 blue cubes in the box.

(b) Work out the total number of cubes in the box.

$$20 \div 4 = 5$$

so $0.1x$ is 5

$$\begin{array}{l} \times 10 \swarrow \quad 0.1x = 5 \\ \quad \quad \quad x = 50 \quad \searrow \times 10 \end{array}$$

50 cubes

(2)

(Total for Question 22 is 4 marks)



23 Deon needs 60 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 60 biscuits.

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

$$\frac{60}{15} = 4$$

$$4 \times 60 \text{ g sugar} = 240 \text{ g sugar.}$$

$$3 \times 240 = 720 \text{ g of flour}$$

$$\frac{720}{(3)} \text{ g}$$

Deon has to buy all the butter she needs to make 60 biscuits.
She buys the butter in 250 g packs.

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

$$2 \times 240 \text{ g} = 480 \text{ g.}$$

$$1 < \frac{480}{250} < 2$$

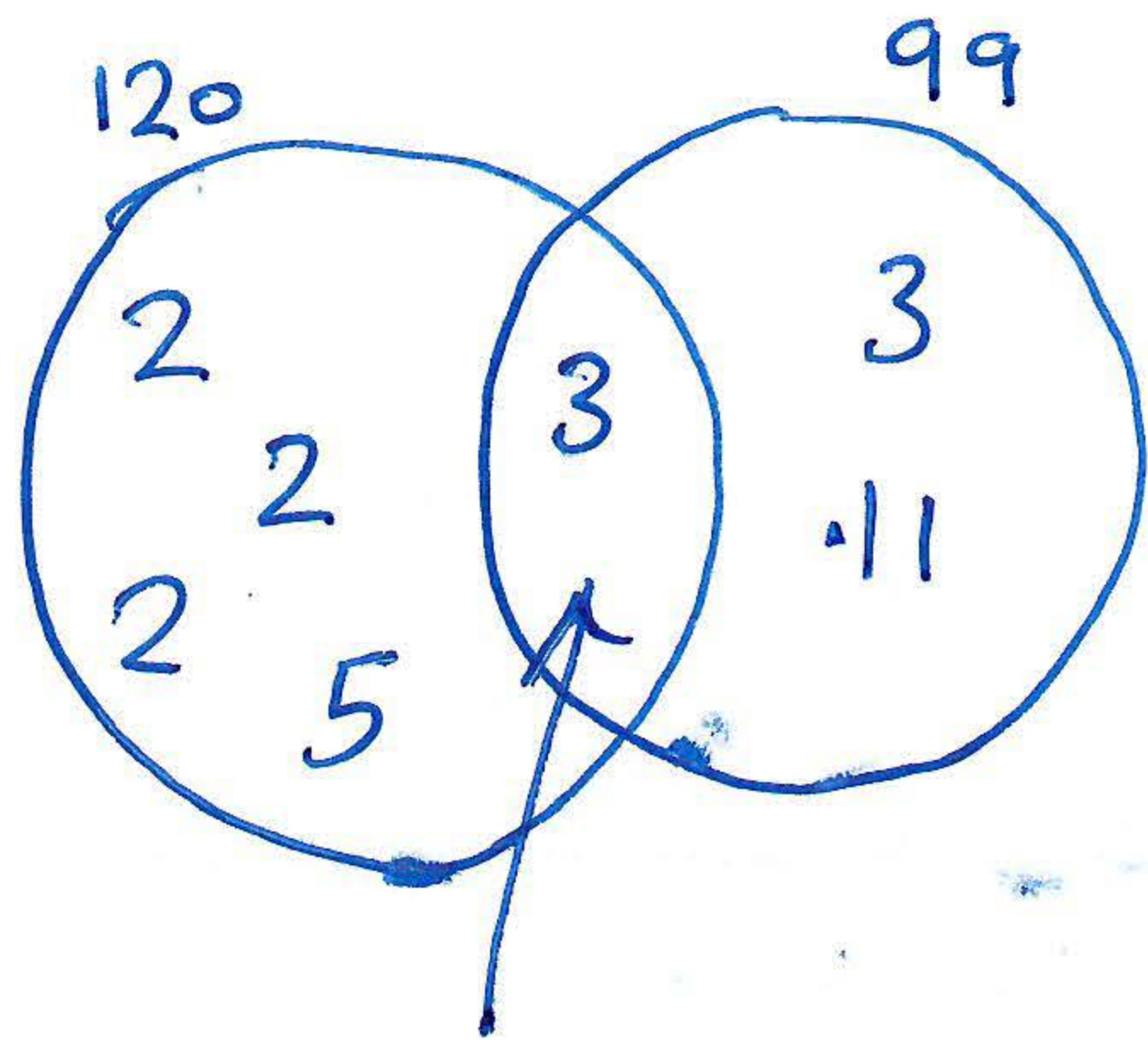
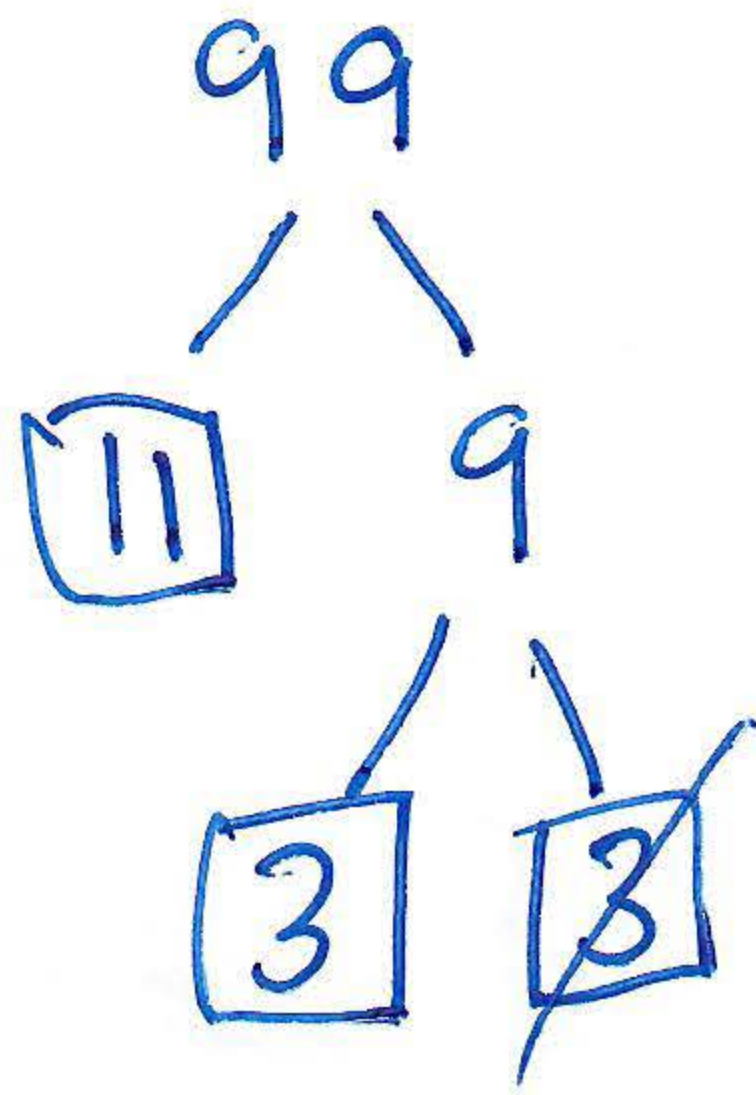
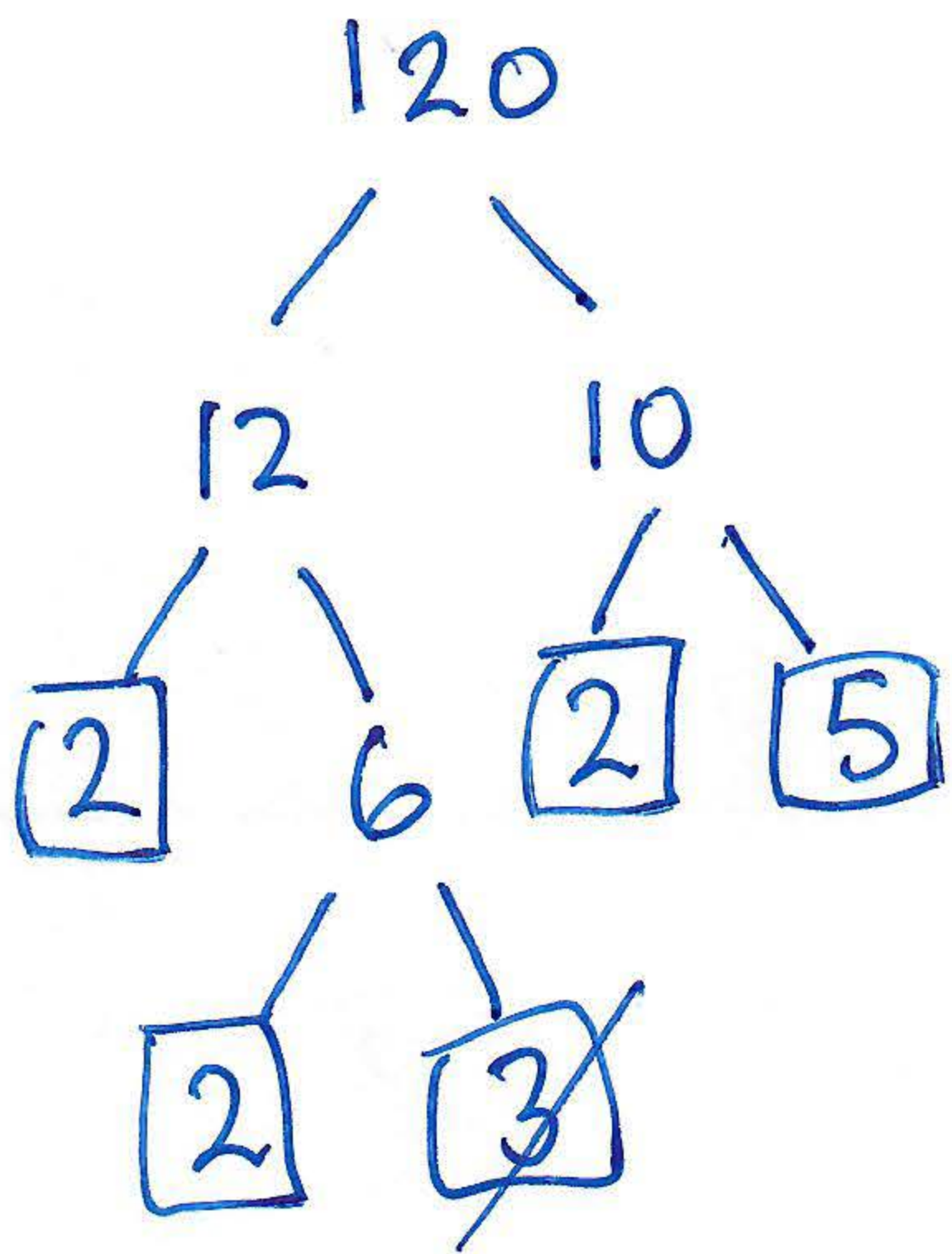
So Deon will need 2 packs of butter

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

(Total for Question 23 is 5 marks)



24 Find the highest common factor (HCF) of 120 and 99



$$\text{HCF}(99, 120) = 3$$

(Total for Question 24 is 2 marks)

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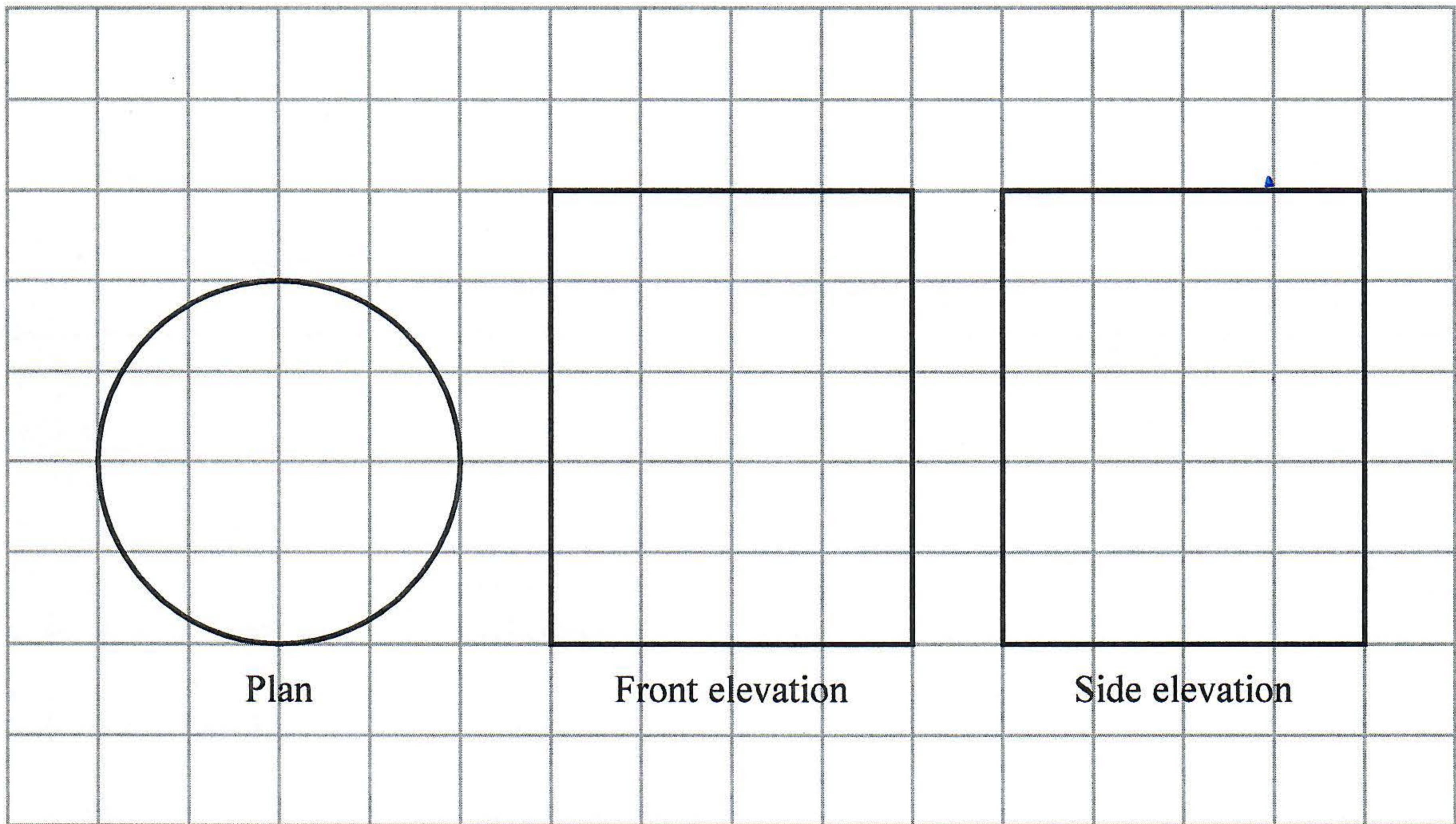


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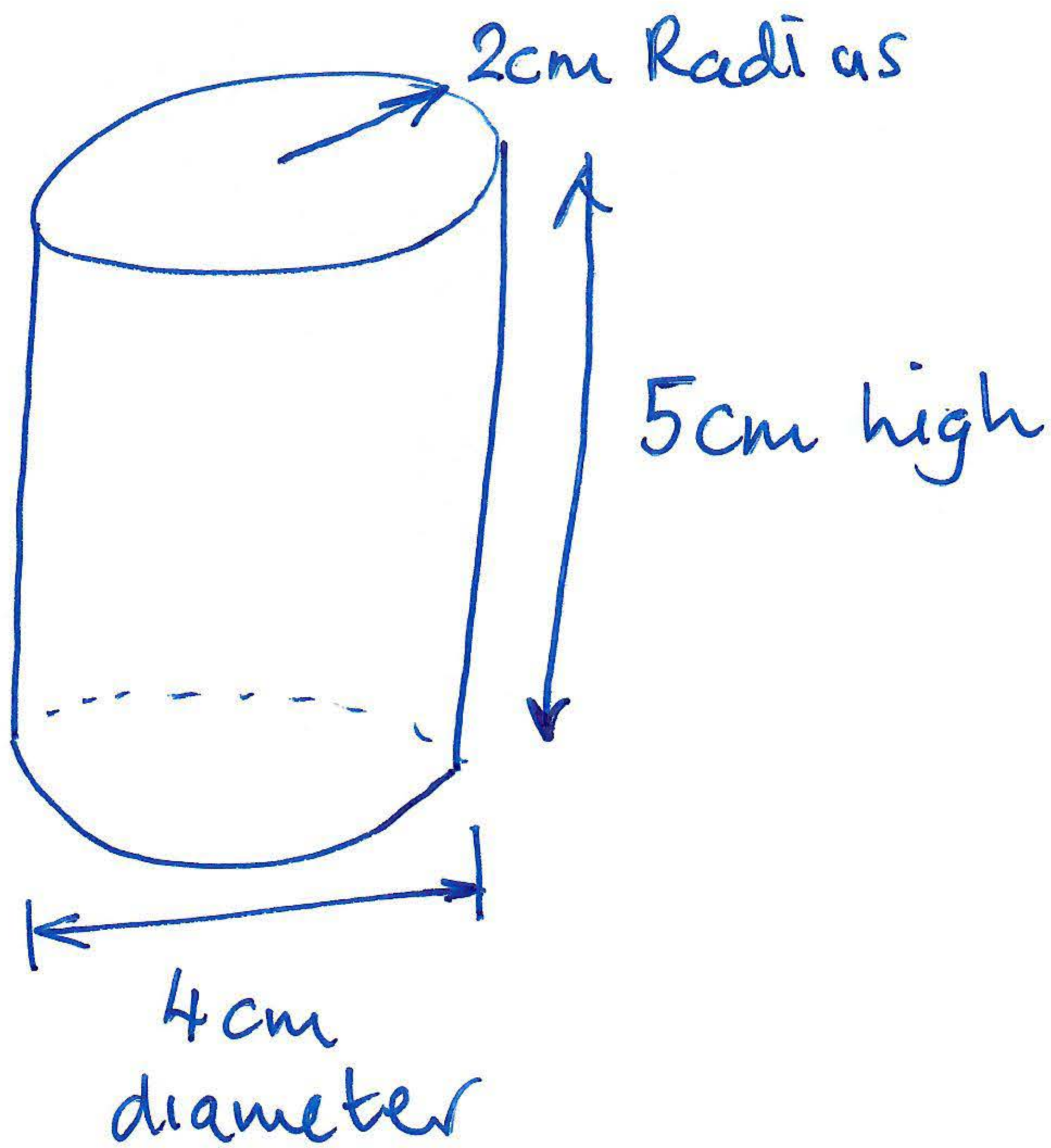
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25 The diagram shows the plan, front elevation and side elevation of a solid shape, drawn on a centimetre grid.

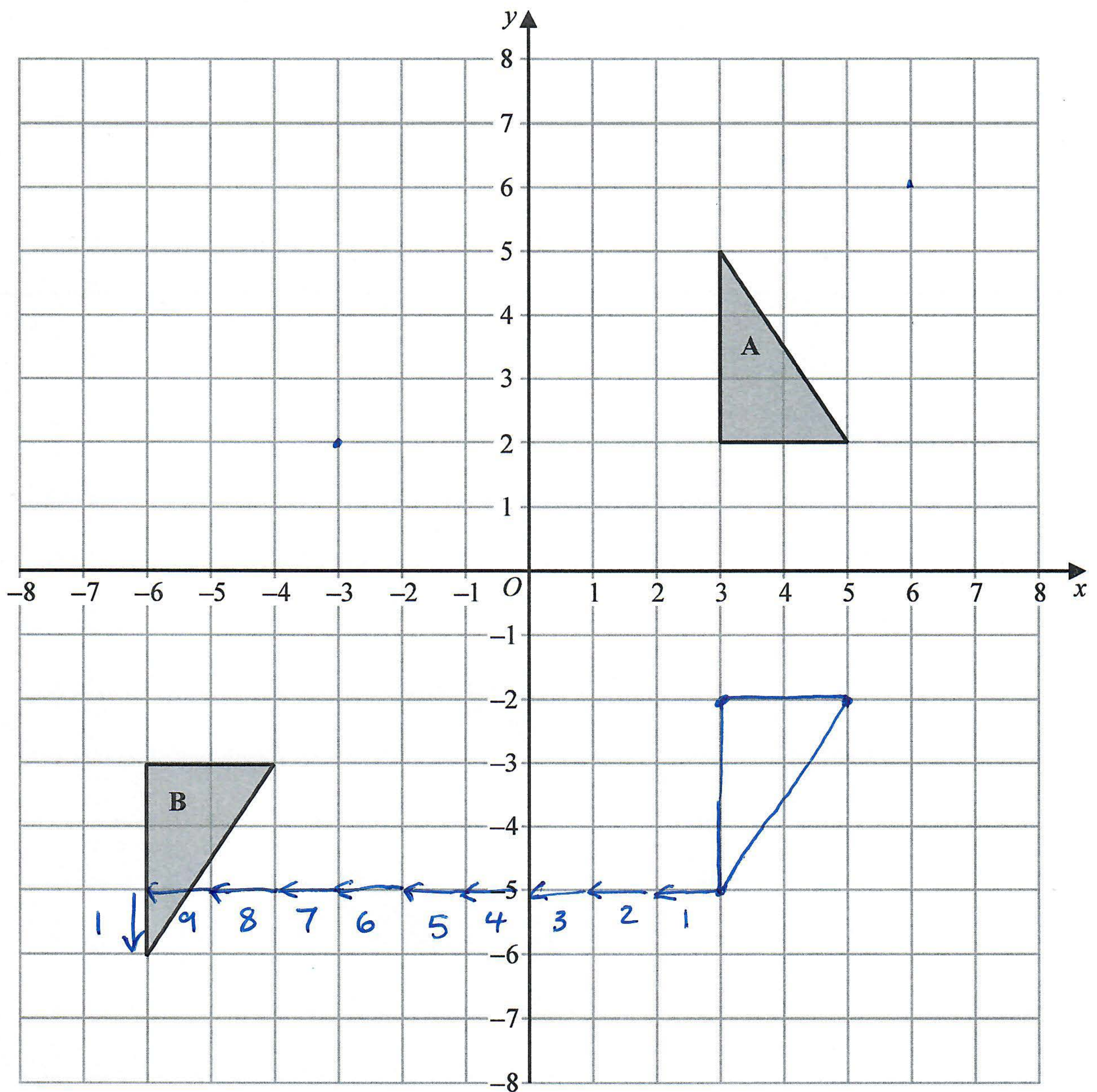


In the space below, draw a sketch of the solid shape.
Give the dimensions of the solid on your sketch.



(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 .

$c = -9$

$d = -1$

(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

3 pens in each pack of black pens

8 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 296 pens were sold.

Work out the number of green pens sold.

$$\begin{array}{ccc} \text{Black} & \text{Red} & \text{Green} \\ 9 \times 3 = 27 & : 4 \times 8 = 32 & : 3 \times 5 = 15 \end{array}$$

$$\begin{aligned} \text{So one batch of these pens} &= 27 + 32 + 15 \\ &= 74 \text{ pens} \end{aligned}$$

$$296 \div 74 = 4$$

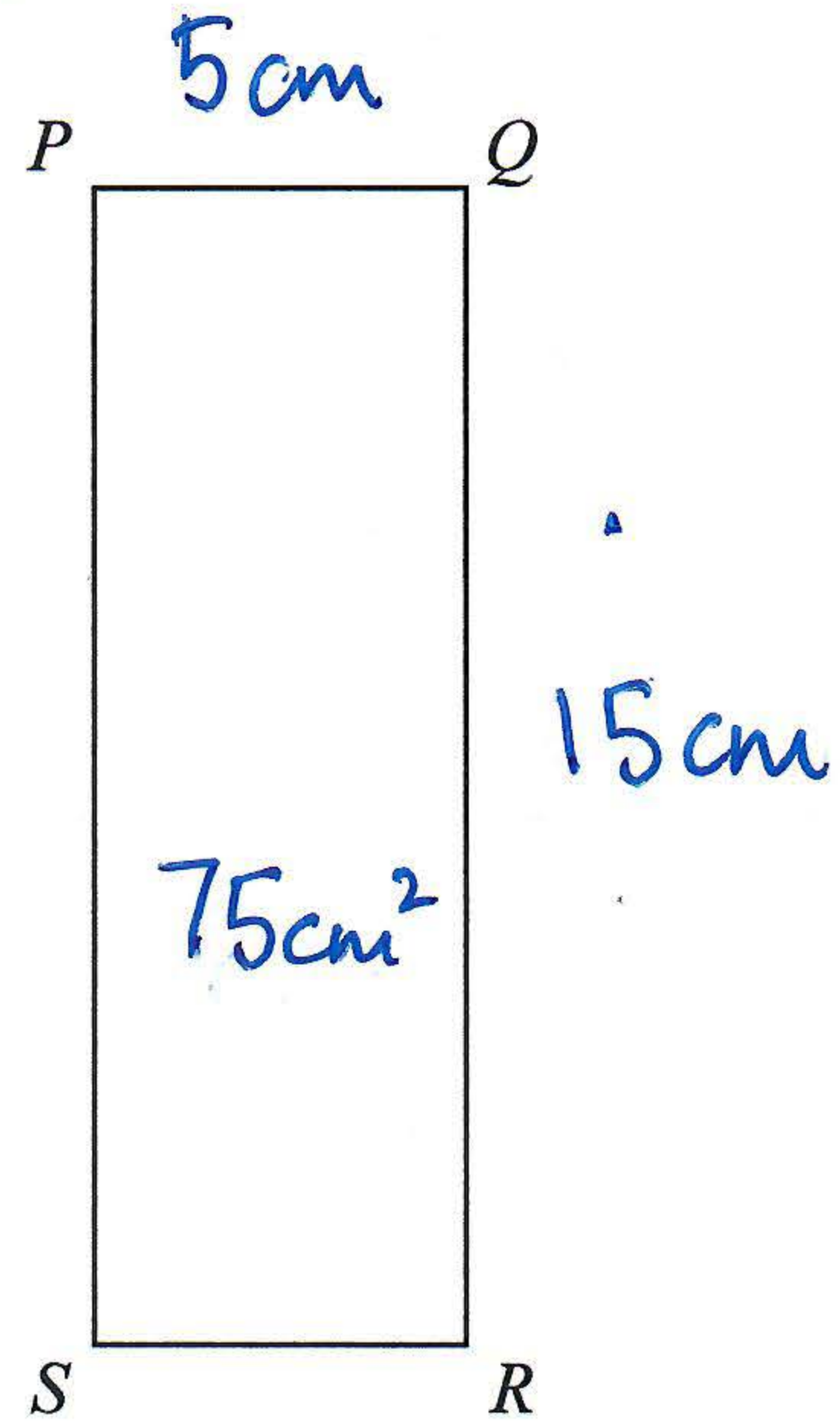
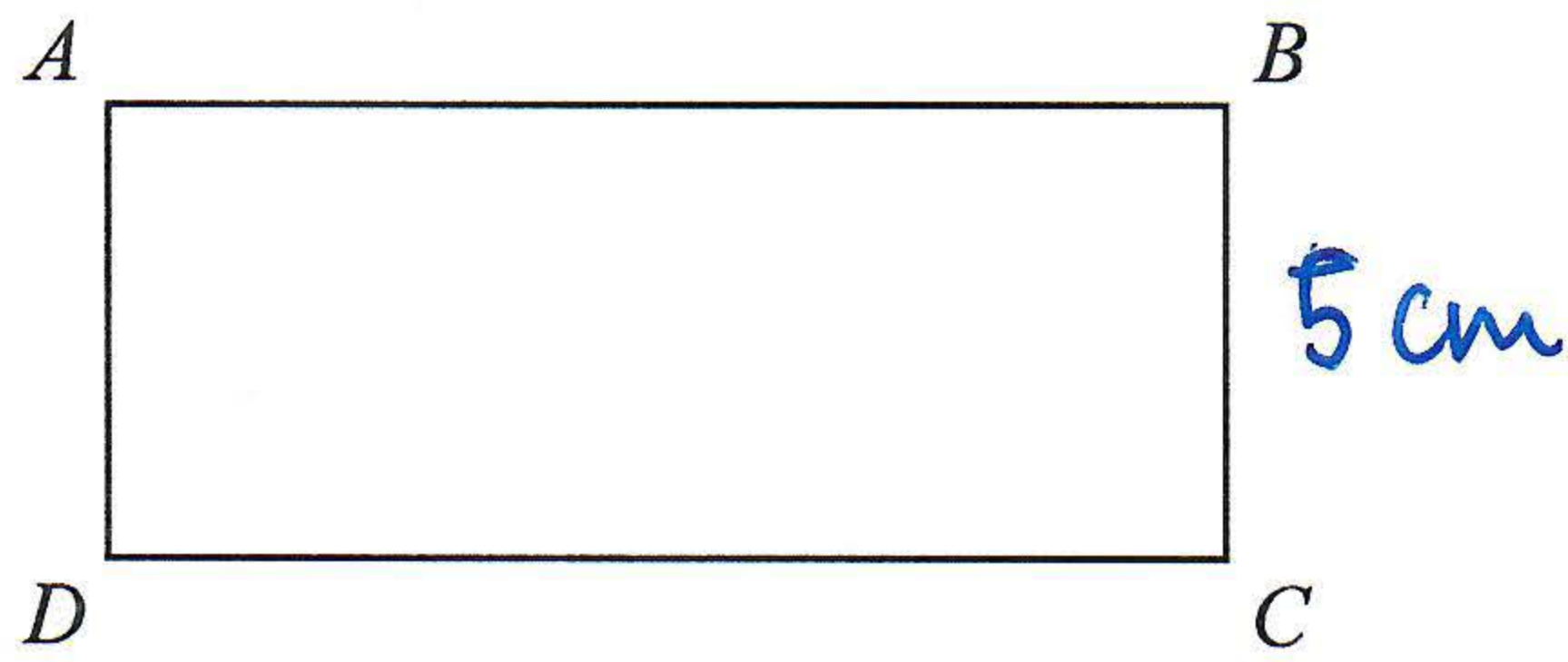
So sold 4 batches altogether.

$$4 \times 15 = 60 \text{ green pens}$$

(Total for Question 27 is 4 marks)



28 Here are two rectangles.



$$QR = 15 \text{ cm}$$

$$BC = PQ$$

The perimeter of $ABCD$ is 38 cm
 The area of $PQRS$ is 75 cm^2

Find the length of AB .

$$\frac{75}{15} = 5 \text{ cm (length of } PQ \text{ and } BC)$$

$$\frac{38}{2} = 19$$

$$19 - 5 = 14 \text{ cm}$$

$$\therefore AB = 14 \text{ cm}$$

..... 14 cm

(Total for Question 28 is 4 marks)

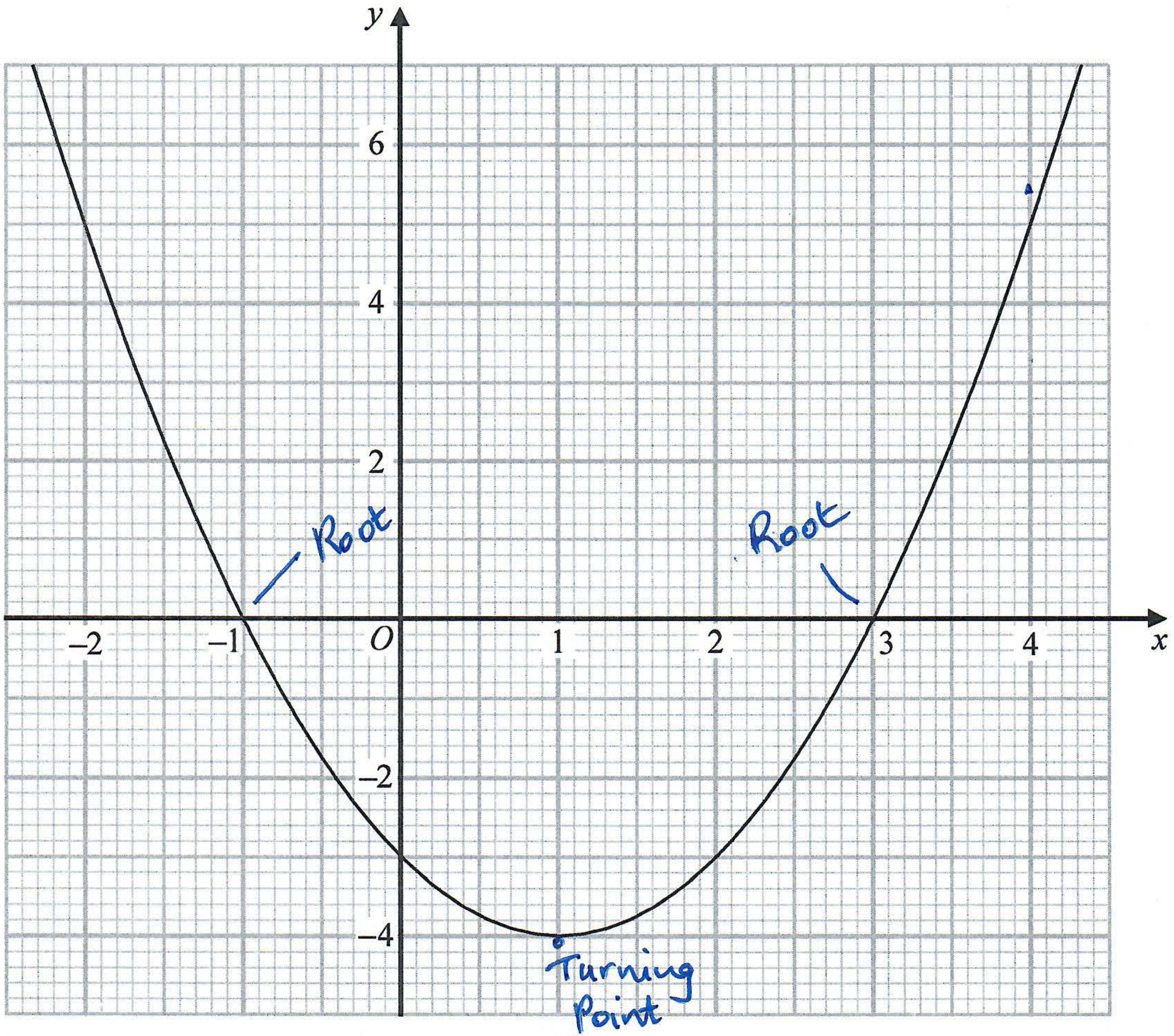


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29 Here is the graph of $y = x^2 - 2x - 3$



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

(1, -4)
(1)

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

$x = -1$ or $x = 3$
(2)

(Total for Question 29 is 3 marks)

TOTAL FOR PAPER IS 80 MARKS



Please check the examination details below before entering your candidate information

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Other names

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Level 1/Level 2 GCSE (9–1)

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Thursday 6 June 2019

Morning (Time: 1 hour 30 minutes)

Paper Reference **1MA1/2F**

Mathematics Shadow Set A

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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- 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
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Advice

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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 0.68 as a fraction.

$$\frac{68}{100}$$

(Total for Question 1 is 1 mark)

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

-3 -4 0 1 -2

$$-4, -3, -2, 0, 1$$

(Total for Question 2 is 1 mark)

3 Write down two factors of 24

1, 24
2, 12
3, 8
4, 6

Any of these would do.

3, 8

(Total for Question 3 is 1 mark)

4 Change 2846 grams to kilograms.

$$2846 \div 1000 = 2.846$$

2.846 kg

(Total for Question 4 is 1 mark)

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5 Write the number four million in figures.

4,000,000

(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 £3.25

The cake costs £3.80

Dave pays with a £20 note.

He thinks he will get more than £9.50 in change.

Is Dave correct?

You must show how you get your answer.

$$\begin{array}{l} \text{Coffee} \quad 2 \times 3.25 = 6.50 \\ \text{Cake} \quad 1 \times 3.80 = 3.80 \\ \hline \text{Total} \quad 10.30 \end{array}$$

$$\begin{array}{r} \text{Change} \quad 20.00 \\ \quad \quad \quad 10.30 \\ \hline \quad \quad \quad 9.70 \end{array}$$

Answer statement.

Dave is correct as he gets £9.70 change which is more than £9.50.

(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 $b \times c \times 11$

$$11bc$$

(1)

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

$$d^3$$

(1)

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

$$\frac{d}{f}$$

(2)

(Total for Question 8 is 4 marks)

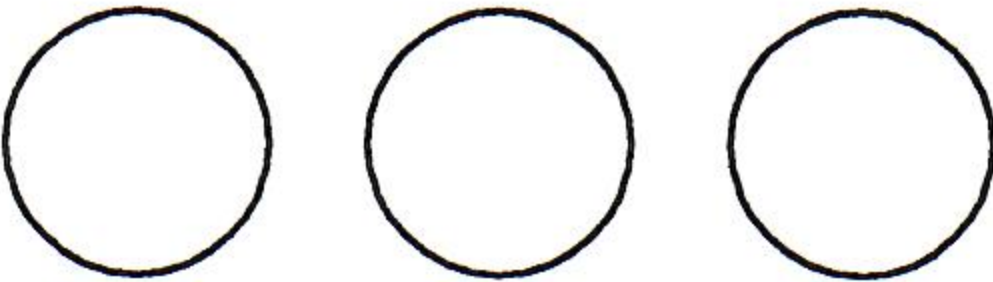
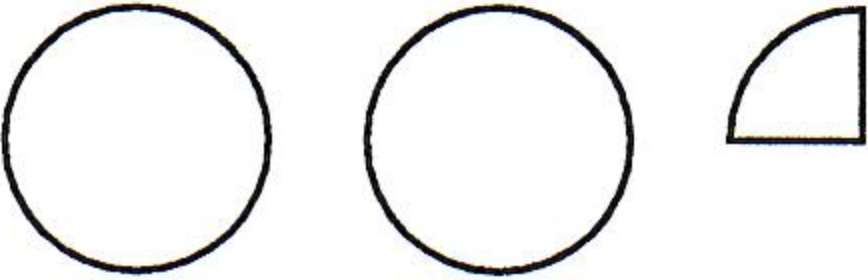
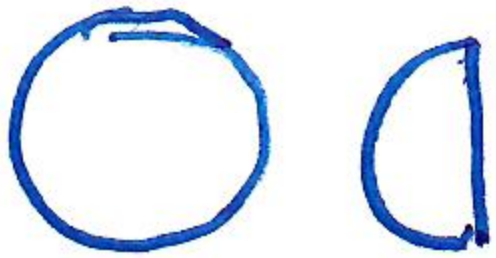

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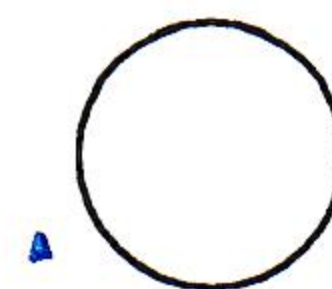
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- 9 The pictogram shows information about the number of vinyl records sold in a shop on Monday and on Tuesday.

Monday	
Tuesday	
Wednesday	
Thursday	

Key:



represents
12 vinyl records

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

- (i) on Monday,

$$3 \times 12 = 36$$

36

(1)

- (ii) on Tuesday.

$$2\frac{1}{4} \times 12 = 27$$

27

(1)

On Wednesday and Thursday a total of 54 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.

$$\frac{54}{3} = 18$$

Wed = 18 records



Transfer this
to the pictogram

Thurs = 36 records



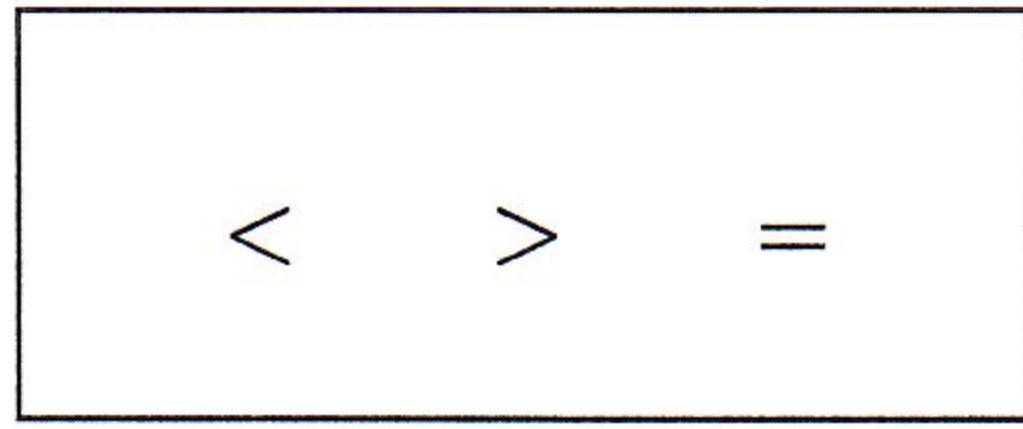
(3)

(Total for Question 9 is 5 marks)



P 5 4 2 2 7 A 0 5 2 0

10 Here are three symbols.



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

$$14 \quad > \quad 7$$

$$4 + 8 \quad = \quad 104 - 92$$

$$2^2 \quad = \quad 2 \times 2$$

$$-7 \quad > \quad -9$$

(Total for Question 10 is 2 marks)

11 $P = 3r + 8q$

Work out the value of P when $r = 7$ and $q = -6$

$$P = 3(7) + 8(-6)$$

$$= 21 + (-48)$$

$$= 21 - 48$$

$$= -27$$

$$\dots\dots\dots -27$$

(Total for Question 11 is 2 marks)

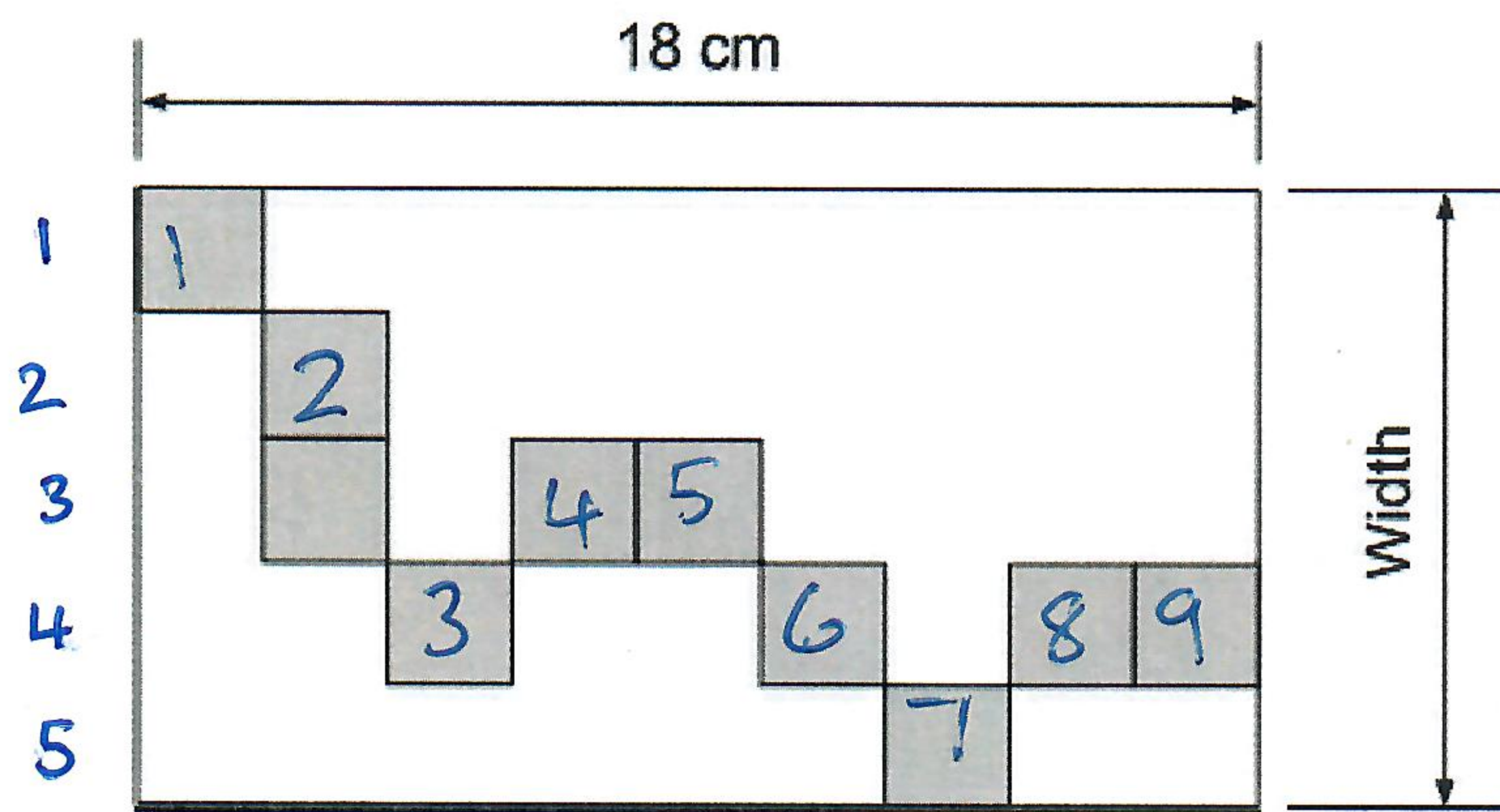
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13 The diagram shows nine identical squares inside a rectangle.



The length of the rectangle is 18 cm.

Work out the width of the rectangle.

$$\frac{18}{9} = 2 \text{ cm.}$$

$$5 \times 2 = 10$$

..... 10 cm

(Total for Question 13 is 3 marks)

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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	0.44
B	0.044
C	$\frac{1}{4}$ 0.25
D	40% 0.4

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

↑ Convert into one type of unit.
~~B~~ 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.

This is incorrect because the sum of all probabilities is one. $1 - \frac{1}{4} = \frac{3}{4}$ which is 3 times as much.

(1)

Coin B is going to be thrown 6000 times.

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

6000
 0.044 x

 24000
 240000

 264000

Remember the zero!

264

(2)

Count the 3 decimal places in ...

(Total for Question 16 is 5 marks)



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

Priti has 75 g of banana and 210 g of yogurt for breakfast.

Work out the total number of calories in this breakfast.

Banana

$$\frac{75}{100} \times 84 = 63$$

Yoghurt

$$\frac{210}{100} \times 87 = 182.7$$

$$2.1 \times 87 = 182.7$$

Total

$$\begin{array}{r} 182.7 \\ 63.0 + \\ \hline 245.7 \end{array}$$

245.7 cal.

(Total for Question 17 is 4 marks)



18 Machine A and machine B both make car parts.

Machine A makes 6 parts every 12 minutes.
Machine B makes 11 parts every 15 minutes.

On Monday

machine A makes parts for 9 hours
machine B makes parts for 14 hours

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

No of cycles in an hour

$$A: 60 \div 12 = 5$$

$$B: 60 \div 15 = 4$$

No of parts in an hour

$$A: 5 \times 6 = 30 \text{ parts}$$

$$B: 4 \times 11 = 44 \text{ parts}$$

No. of parts on Monday

$$A: 30 \times 9 = 270 \text{ parts}$$

$$B: 44 \times 14 = 616 \text{ parts}$$

Total number of parts

$$\begin{array}{r} 616 \\ 270+ \\ \hline 886 \end{array}$$

$$\begin{array}{r} 44 \\ 14 \times \\ \hline 176 \\ 440 \\ \hline 616 \end{array}$$

886 parts

(Total for Question 18 is 4 marks)

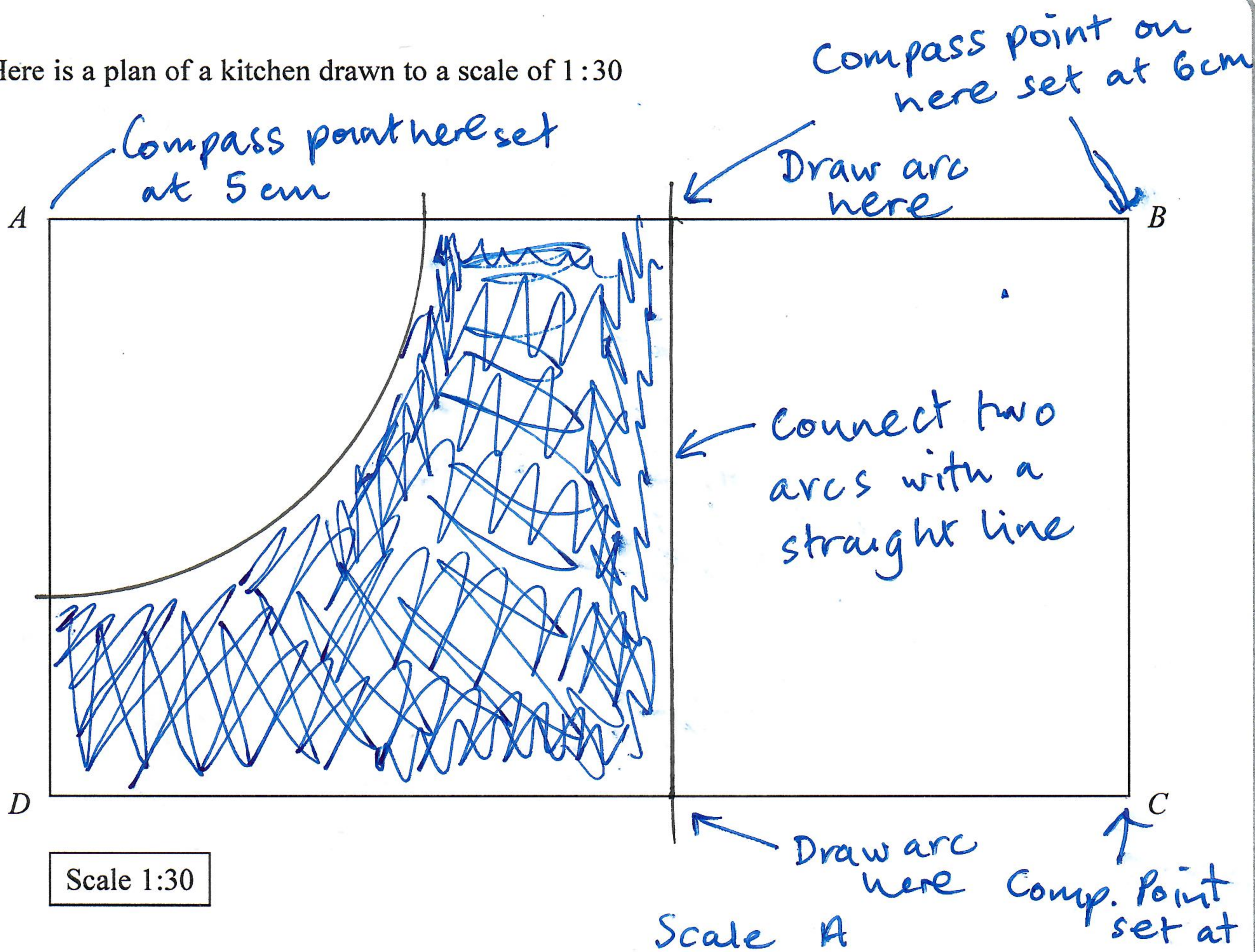


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19 Here is a plan of a kitchen drawn to a scale of 1:30



Scale 1:30

Scale A

$$\frac{150}{30} \times 1 = 5 \text{ cm}$$

$$\text{Scale BC } \frac{180}{30} \times 1 = 6 \text{ cm}$$

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

The table has to be
more than 150 cm from A
more than 180 cm from BC

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

(Total for Question 19 is 4 marks)



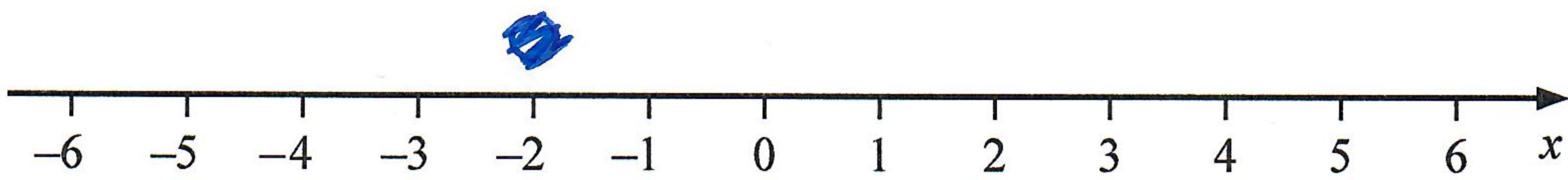
20 (a) Solve $17n > 12n + 15$

$$\begin{aligned} 17n &> 12n + 15 && \xrightarrow{-12n} \\ -12n & \swarrow && \searrow \\ 5n &> 15 && \\ \div 5 & \swarrow && \searrow \div 5 \\ n &> 3 && \end{aligned}$$

$$\underline{n > 3} \quad (2)$$

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

See calculation of x at the bottom.



Not coloured in because $<$ No equals

Coloured in because \leq Equals (3)

(Total for Question 20 is 5 marks)

$$\begin{aligned} -2 < x + 2 \leq 4 &&& \xrightarrow{-2} \\ -4 < x \leq 2 &&& \end{aligned}$$



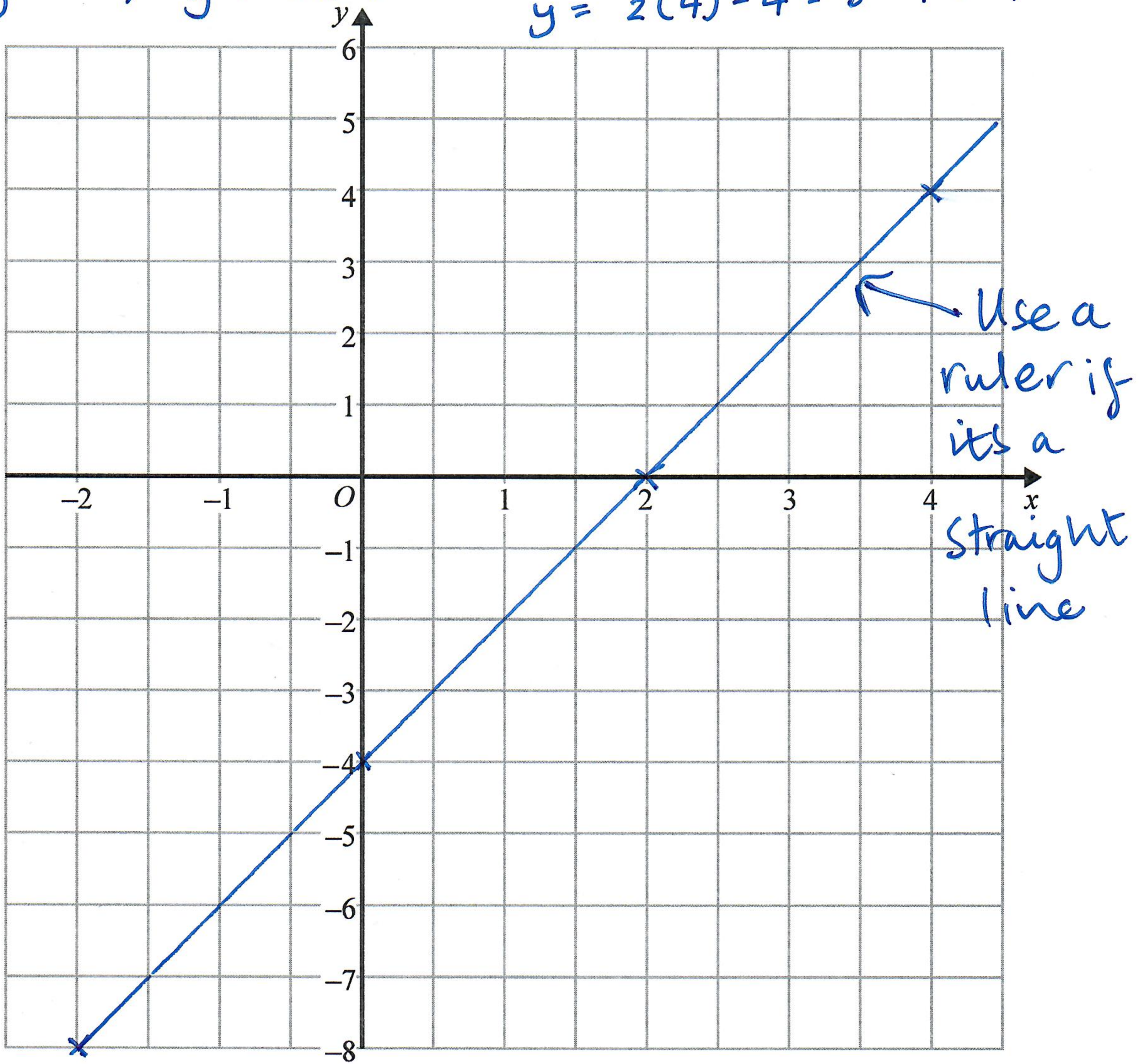
21 On the grid below, draw the graph of $y = 2x - 4$ for values of x from -2 to 4

x	-2	0	2	4
y	-8	-4	0	4

← You must do this.

This is how I calculated

$$y = 2(-2) - 4 = -4 - 4 = -8$$
$$y = 2(0) - 4 = 0 - 4 = -4$$
$$y = 2(2) - 4 = 4 - 4 = 0$$
$$y = 2(4) - 4 = 8 - 4 = 4$$



(Total for Question 21 is 3 marks)



22 Hannah is planning a day trip for 210 students.

She asks a sample of 30 students where they want to go.
Each student chooses one place.

The table shows information about her results.

Place	Number of students
Theme Park	8
Theatre	6
Sports Centre	9
Seaside	7

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

$$\frac{8}{30} \times 210 = 8 \times 7 = 56$$

56
(2)

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

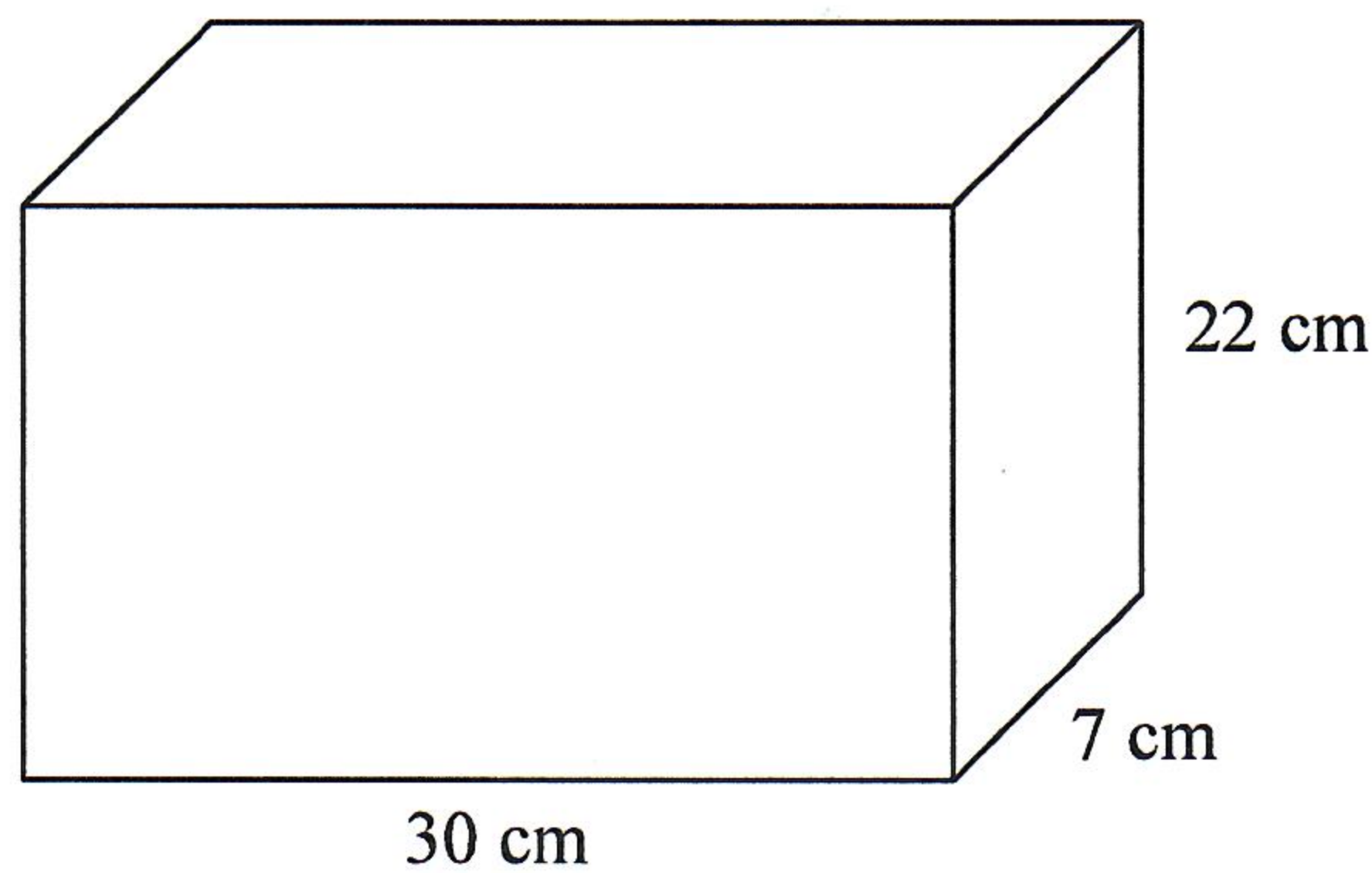
The sample was a simple random sample and was representative of the whole group of students.

(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?

Volume of cuboid

$$\begin{aligned} V &= l \times w \times h \\ &= 30 \times 7 \times 22 \\ &= 4620 \text{ ml} \end{aligned}$$

Volume of water

$$\frac{2}{3} \times 4620 = 3080$$

No. of cups

$$3080 \div 245$$

12 full cups of water.

$$\begin{array}{r} 210 \\ 22 \\ \hline 420 \\ 4200 \\ \hline 4620 \end{array}$$

$$\begin{array}{r} 1540 \\ 3 \overline{) 4620} \\ \hline 1540 \\ \underline{2} \times \\ 3080 \end{array}$$

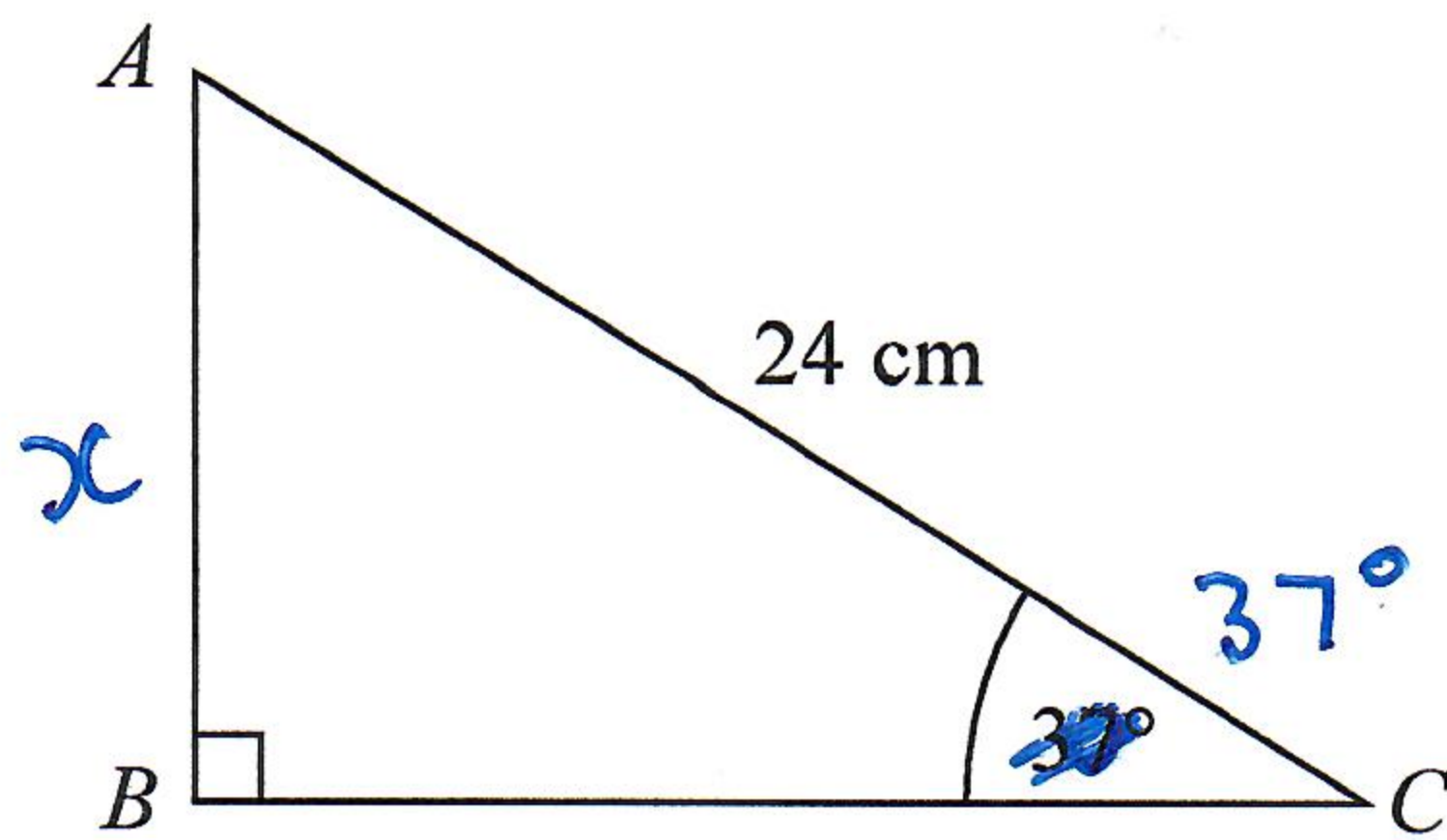
$$\begin{array}{r} 12 \\ 245 \overline{) 3080} \\ \underline{245} \downarrow \\ 5630 \\ \underline{490} \\ 140 \end{array}$$

12

(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.

$$S = \frac{O}{H}$$

$$C = \frac{A}{H}$$

$$T = \frac{O}{A}$$

$$\sin 37^\circ = \frac{x}{24}$$

$$\therefore x = 24 \sin 37^\circ$$

$$= 14.44356056$$

$$\approx 14.44 \text{ cm}$$

Make sure your calculator is on deg and NOT rad or grad. 14.44.....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

8.6

Truncated

Complete the error interval for y .

$$8.6 \leq y < 8.7$$

$$8.6 \leq y < 8.7$$

(Total for Question 25 is 2 marks)



26 £480 is shared between Abby, Ben, Chloe and Denesh.

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

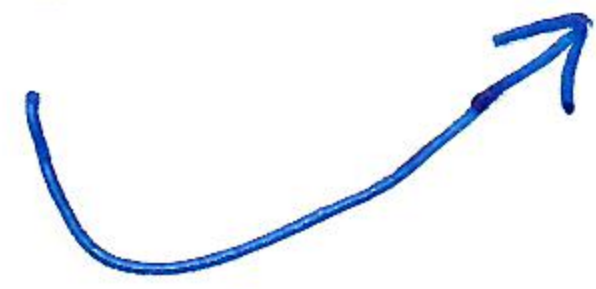
Chloe and Denesh each get 1.5 times the amount Abby gets.

Work out the amount of money that Ben gets.

Find Ratio

A : B : C : D

2 : 7 : 3 : 3



$$1\frac{1}{2} \times 2 = 3$$

No of parts

$$2 + 7 + 3 + 3 = 15$$

Value of one part

$$\frac{480}{15} = 32$$

Ben gets 7 parts

$$7 \times 32 = 224$$

£ 224.00

(Total for Question 26 is 4 marks)

27 (a) Write 0.00738 in standard form.

738
123

$$7.38 \times 10^{-3}$$

$$7.38 \times 10^{-3}$$

(1)

(b) Write 3.492×10^4 as an ordinary number.

1 2 3 4
3.49200

$$34,920$$

(1)

(Total for Question 27 is 2 marks)



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

7 7 14 21 35

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

$$21 + 35 = 56$$

$$35 + 56 = 91$$

..... 56 , 91
(1)

The first three terms of a different Fibonacci sequence are

k k $2k$

(b) Find the 6th term of this sequence.

k k $2k$ $3k$ $5k$ $8k$

Add the previous two terms together.

..... 8k

(2)

(Total for Question 28 is 3 marks)

29 $a = \begin{pmatrix} 4 \\ 5 \end{pmatrix}$ $b = \begin{pmatrix} 3 \\ 2 \end{pmatrix}$

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

$$\begin{pmatrix} 4 \\ 5 \end{pmatrix} - 3 \begin{pmatrix} 3 \\ 2 \end{pmatrix} = \begin{pmatrix} 4 \\ 5 \end{pmatrix} - \begin{pmatrix} 9 \\ 6 \end{pmatrix} = \begin{pmatrix} -5 \\ -1 \end{pmatrix}$$

$\begin{pmatrix} -5 \\ -1 \end{pmatrix}$

(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

Centre Number

Candidate Number

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

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Tuesday 11 June 2019

Morning (Time: 1 hour 30 minutes)

Paper Reference **1MA1/3F**

Mathematics Shadow Set A

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 ►

P55606A

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6/7/1/1/1/1/




Pearson

Answer ALL questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

1 Write 458 to the nearest hundred.

5 or more rounds up

500

(Total for Question 1 is 1 mark)

2 Write down a multiple of 7 that is between 41 and 60

$$6 \times 7 = 42$$

$$8 \times 7 = 56$$

$$7 \times 7 = 49$$

56

(Total for Question 2 is 1 mark)

3 Change 1.7 kilometres to metres.

$$1.7 \times 1000 = 1,700$$

1000 m = 1 km

1,700

metres

(Total for Question 3 is 1 mark)

4 Here is a list of numbers.

4

6

9

10

16

27

30

64

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

$$4^1 = 4$$

$$4^2 = 16$$

$$4^3 = 64$$

4, 16, 64

(Total for Question 4 is 1 mark)

5 Write 27% as a fraction.

Percent means per 100

$\frac{27}{100}$

(Total for Question 5 is 1 mark)

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- 6 Work out 40% of 160

$$\frac{40}{100} \times 160 = 4 \times 16 = 64$$

..... 64

(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	26	44	13	7

There are more green counters than red counters.
How many more?

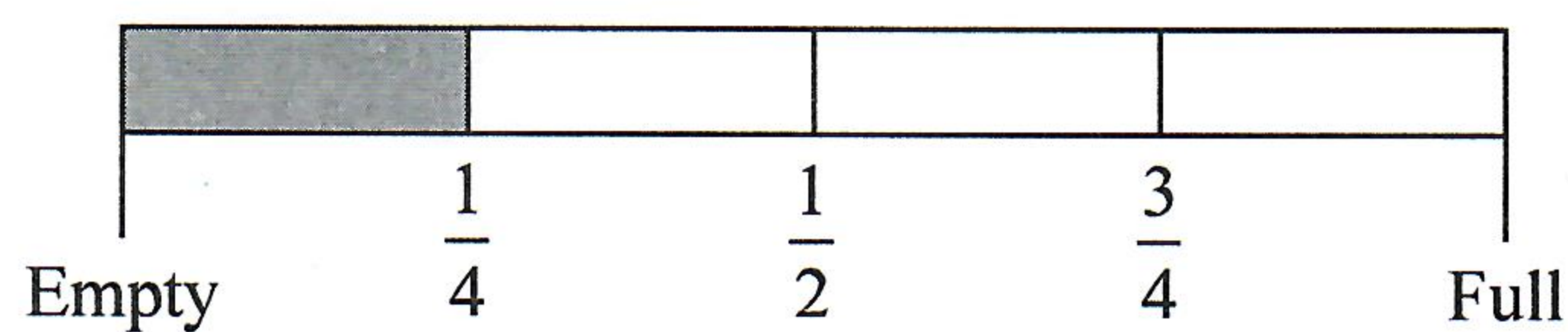
$$\begin{array}{l} \text{Green} \quad 44 + 7 = 51 \\ \text{Red} \quad 26 + 13 = 39 \end{array}$$

$$51 - 39 = 12$$

..... 12

(Total for Question 7 is 2 marks)

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



The fuel tank holds 64 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.

$$\frac{1}{4} + \frac{3}{4} = 1$$

$$\frac{3}{4} \times 64 = 48$$

Need $\frac{3}{4}$ of a tank.

..... 48

litres

(Total for Question 8 is 3 marks)



9 Simplify $8e + 12f + 7e - f$

$$8e + 7e = 15e$$

$$12f - f = 11f$$

$$15e + 11f$$

(Total for Question 9 is 2 marks)

10 Bill has 400 counters in a bag.

He gives

35 of the counters to Sameena

50 of the counters to Henry

75 of the counters to Lucas

What fraction of the 400 counters is left in Bill's bag?

Give your fraction in its simplest form.

$$35 + 50 + 75 = 160$$

$$400 - 160 = 240$$

$$\frac{240}{400} = \frac{24}{40} = \frac{3}{5}$$

$$\frac{3}{5}$$

(Total for Question 10 is 3 marks)



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

Type of service	Cost
Express	£15.35
Rapid	£35.38

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?

Express: $15.35 \times 8 = £122.80$

Rapid: $35.38 \times 8 = £283.04$

← Remember 2 digits behind decimal point for money.

Difference: $283.04 - 122.80 = 160.24$

£ 160.24
(3)

Luke wants to send 26 parcels by the Express service.

He does the calculation $25 \times £15 = £375$ to estimate the cost.

(b) Explain why Luke's calculation shows the actual cost will be more than £375

Luke has rounded down the cost of each parcel from £15.35 to £15. The actual cost will be $25 \times 0.35 = £8.75$ higher than his estimate.
(1)

(Total for Question 11 is 4 marks)



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12 Ali, Ben and Cathy share an amount of money in the ratio 7 : 11 : 10

What fraction of the money does Ben get?

$$\begin{aligned} \text{Ali: } & \frac{7}{7+11+10} \\ & = \frac{7}{28} \\ & = \frac{1}{4} \end{aligned}$$

$$\begin{aligned} \text{Ben: } & \frac{11}{7+11+10} \\ & = \frac{11}{28} \end{aligned}$$

$$\begin{aligned} \text{Cathy: } & \frac{10}{7+11+10} \\ & = \frac{10}{28} \\ & = \frac{5}{14} \\ \text{Ben: } & \frac{11}{28} \end{aligned}$$

(Total for Question 12 is 2 marks)

13 The first term of a sequence of numbers is 24
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.

24 31 38 45
 ↖ 5x table ends
 in 5 or 0.

45
.....
(1)

(b) Is 80 a number in this sequence?
Give a reason for your answer.

80 - 24 = 56. Yes, 80 should be in the
sequence because 8 × 7 = 56 and 80 is 56
more than 24. (1)

(Total for Question 13 is 2 marks)

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14 Find the value of $\frac{23.7 + 9.23}{8.2 - 5.91} = \frac{32.93}{2.29} = 14.37991266$

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

14.37991266

(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 weeks.

$$\text{Total hire charge (£)} = \text{number of weeks} \times 65 + 70$$

Mia wants to hire a 3D printer for 4 weeks.

- (a) Work out the total hire charge.

$$(4 \times 65) + 70 = 260 + 70 \\ = 330$$

£ 330.00
(2)

Zahir hires a 3D printer.
The total hire charge is £590

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

$$590 - 70 = 520$$

$$520 \div 65 = 8$$

8

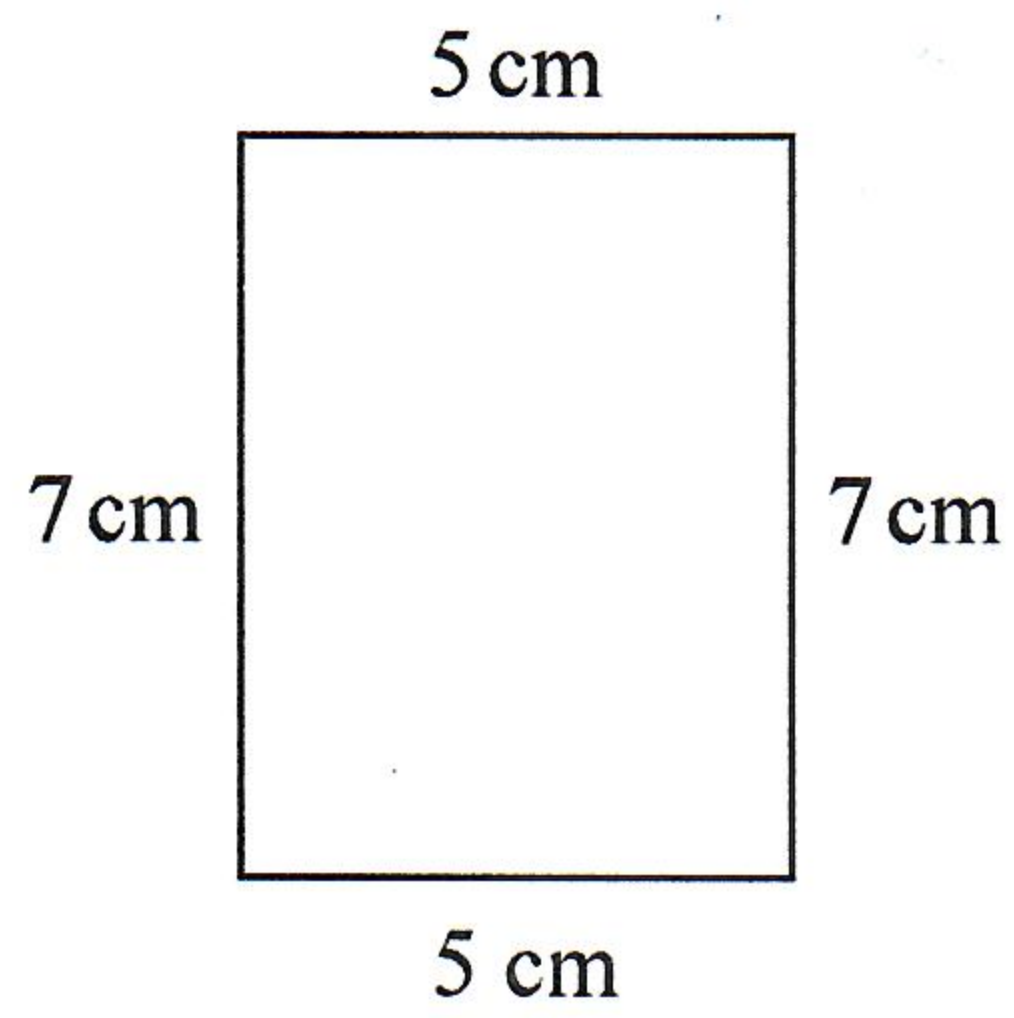
weeks

(2)

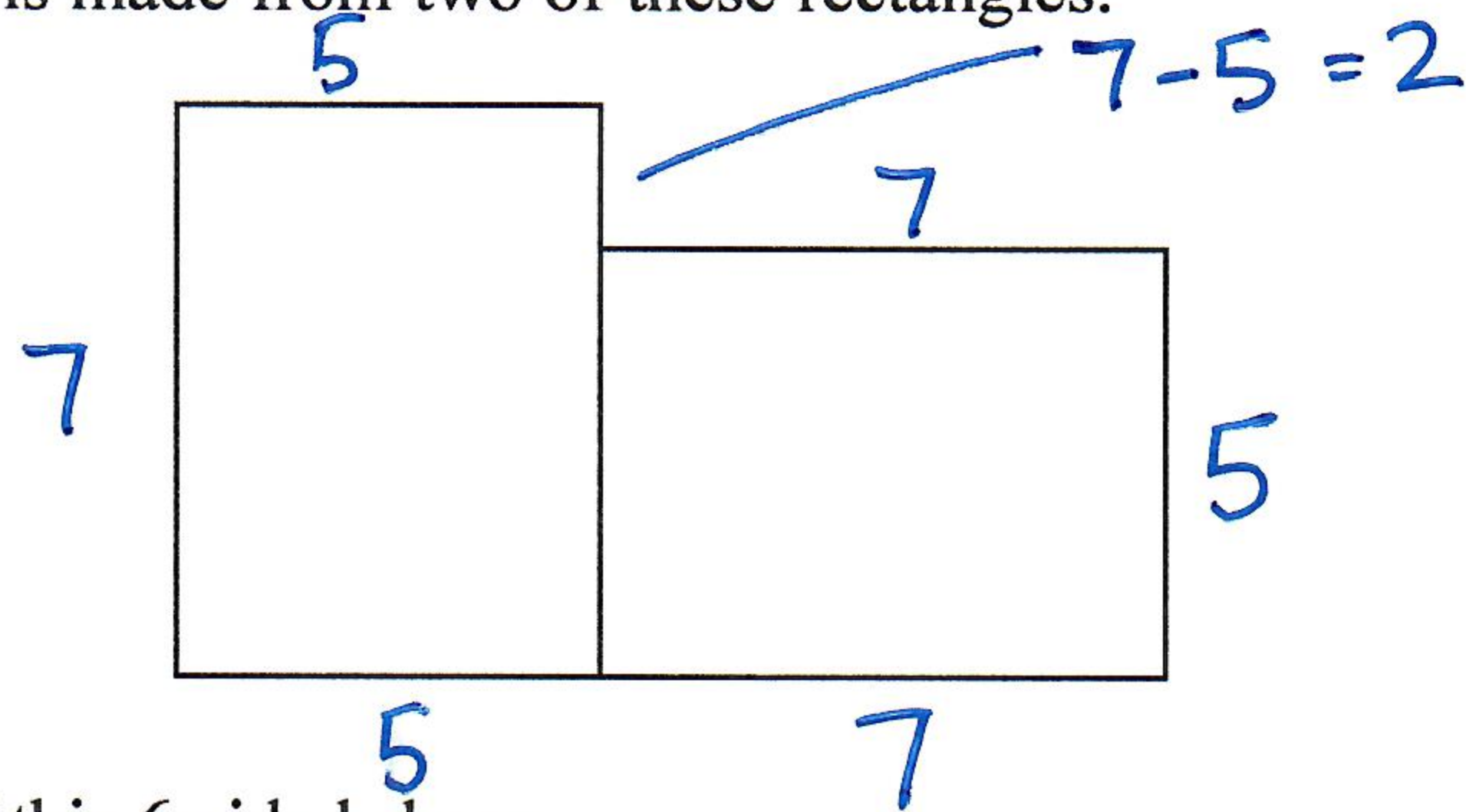
(Total for Question 15 is 4 marks)



16 Here is a rectangle.



The 6-sided shape below is made from two of these rectangles.



Work out the perimeter of this 6-sided shape.

$$7 + 5 + 2 + 7 + 5 + 7 + 5 = 38 \text{ cm}$$

..... 38 cm

(Total for Question 16 is 3 marks)

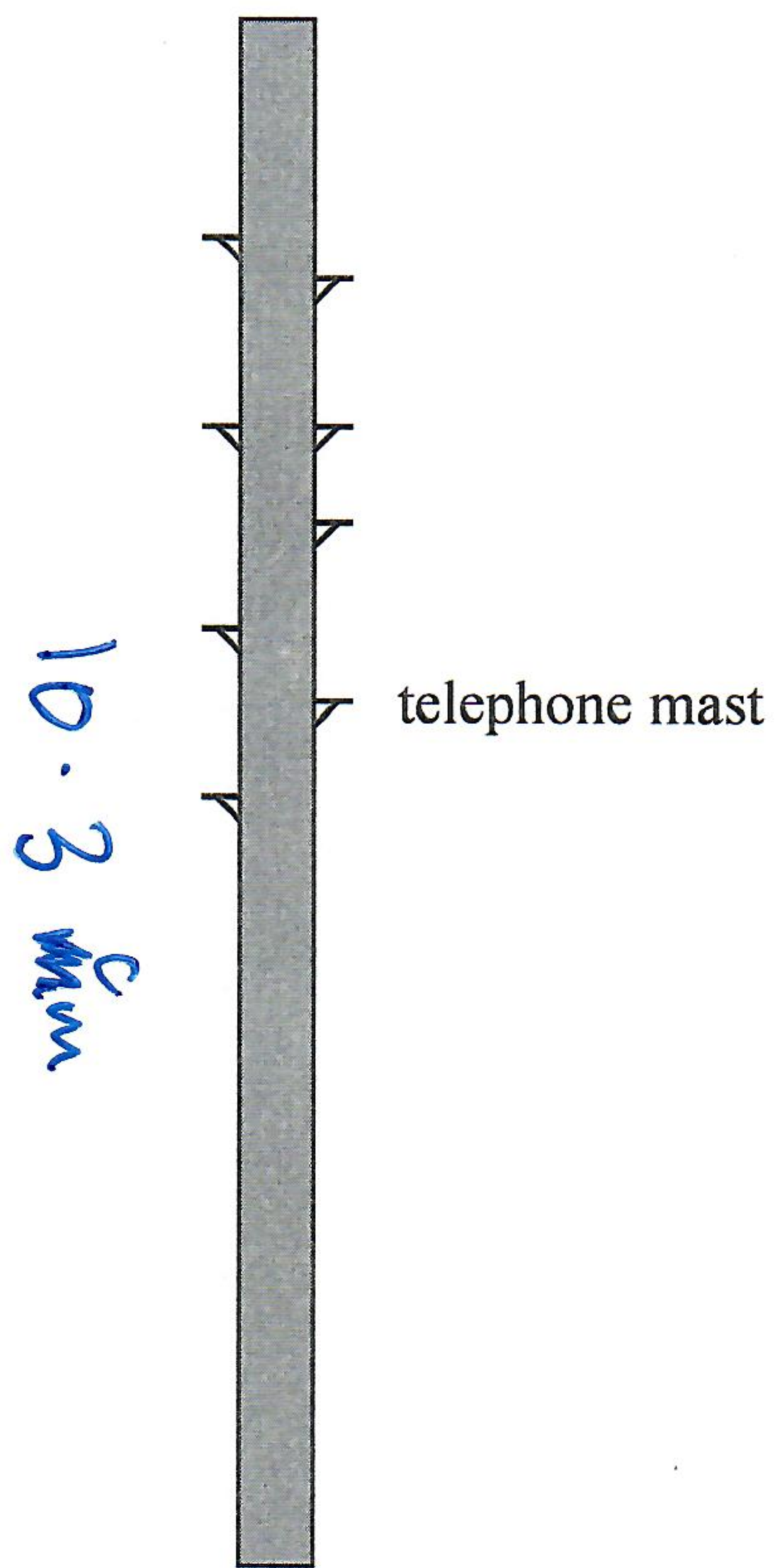
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17 The accurate scale diagram shows a telephone mast and a box.



$$\frac{103}{22} = 4.681818$$

$$4.6818 \times 1.6 = 7.4909$$

The box has a real width of 1.5 metres.

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

..... 7.49 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	7
1	9
2	4
3	6
4	7
5	5

(a) Find the modal number of points.

Mode - highest frequency of points

1

(1)

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

$$\begin{aligned} & (7 \times 0) + (9 \times 1) + (4 \times 2) + (6 \times 3) + (7 \times 4) + (5 \times 5) \\ &= 0 + 9 + 8 + 18 + 28 + 25 \\ &= 88 \end{aligned}$$

88 pts

(2)

(Total for Question 18 is 3 marks)



19 Make x the subject of the formula $y = 5x - 9$

$$\begin{aligned} & y = 5x - 9 \\ +9 & \quad \swarrow \quad \searrow +9 \\ & y + 9 = 5x \\ \div 5 & \quad \swarrow \quad \searrow \div 5 \\ & \frac{y+9}{5} = x \end{aligned}$$

$$\therefore x = \frac{y+9}{5}$$

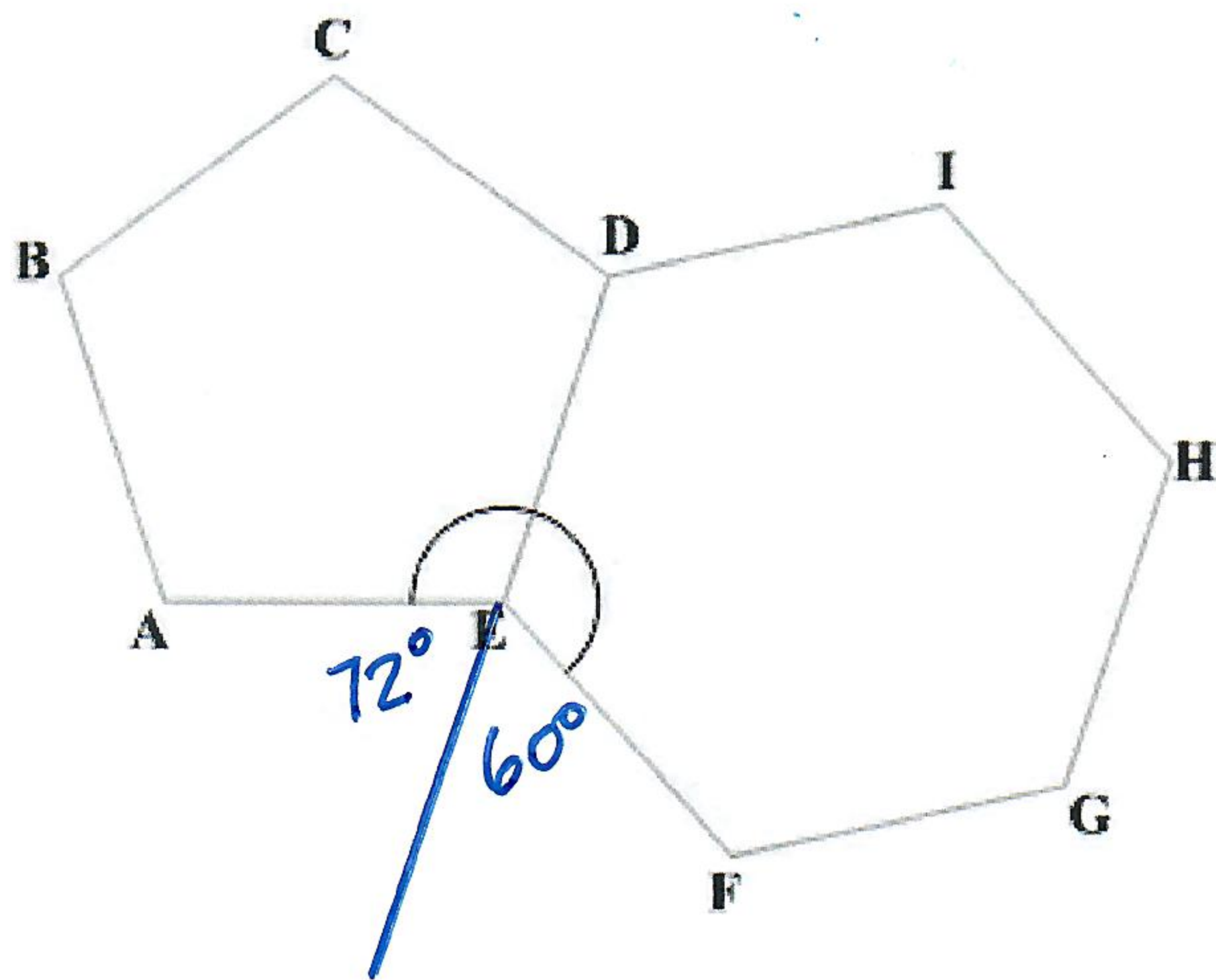
Subject always goes on the left on its own.

$$x = \frac{y+9}{5}$$

(Total for Question 19 is 2 marks)



20 The diagram shows regular pentagon ABCDE and regular hexagon DEFGHI.



Work out the size of angle AEF.

Exterior angle = $\frac{360}{n}$ where n is the number of sides

$$\text{Ext. angle}_{\text{pentagon}} = \frac{360}{5} = 72^\circ$$

$$\text{Ext angle}_{\text{hexagon}} = \frac{360}{6} = 60^\circ$$

$$\text{AEF} = 228^\circ$$

(Total for Question 20 is 2 marks)

$$360 - (72 + 60) = 228 \text{ (Angles about a point sum to } 360^\circ\text{).}$$

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21 Liz goes on holiday to South Africa.

Liz wants to change £1200 into South African rand.
She wants to get as many 200 rand notes as possible.

The exchange rate is £1 = 18.53 rand.

Work out the greatest number of 200 rand notes that Liz can get for £1200

$$1200 \times 18.53 = 22236 \text{ R.}$$

$$22,236 \div 200 = 111.18$$

So Liz can purchase 111 x 200 Rand notes

111

(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 £1.57 per litre.

1 gallon = 4.55 litres.

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

$$670 \div 43.5 = 15.40229885 \text{ gallons / litres of fuel}$$

~~No. of gallons =~~

$$\text{No. of litres} = 15.40229885 \times 4.55$$

$$= 70.08045977 \text{ litres}$$

$$\text{Cost of fuel} = 70.08045977 \times 1.57$$

$$= \text{£} 110.0263218$$

$$\approx \text{£} 110.03 \text{ (to the nearest penny)}$$

£ 110.03

(Total for Question 22 is 4 marks)



23 Costcorp sells packets of mints to shop owners.

On Monday three shop owners buy mints from Costcorp.

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

Alan buys 550 packets of mints.

32% are small packets.

40% are large packets.

Beryl buys 500 packets of mints.

$\frac{5}{10}$ are small packets.

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

Charlie buys 250 small packets of mints so that

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

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

You must show all your working.

Alan

$$100 - (32 + 40) = 100 - 72 = 28\% \text{ medium pkts}$$

$$\frac{28}{100} \times 550 = 154 \text{ medium packets}$$

Beryl

$$\frac{10}{10} - \left(\frac{5}{10} + \frac{1}{10} \right) = \frac{10}{10} - \frac{6}{10} = \frac{4}{10}$$

$$\frac{4}{10} \times 500 = 200 \text{ medium packets}$$

Charlie

$$5 + 6 = 11$$

$$250 \div 11 = 22 \frac{8}{11}$$

$$6 \times 22 \frac{8}{11} = 136.36 \dot{3} \dot{6}$$

Total medium packets

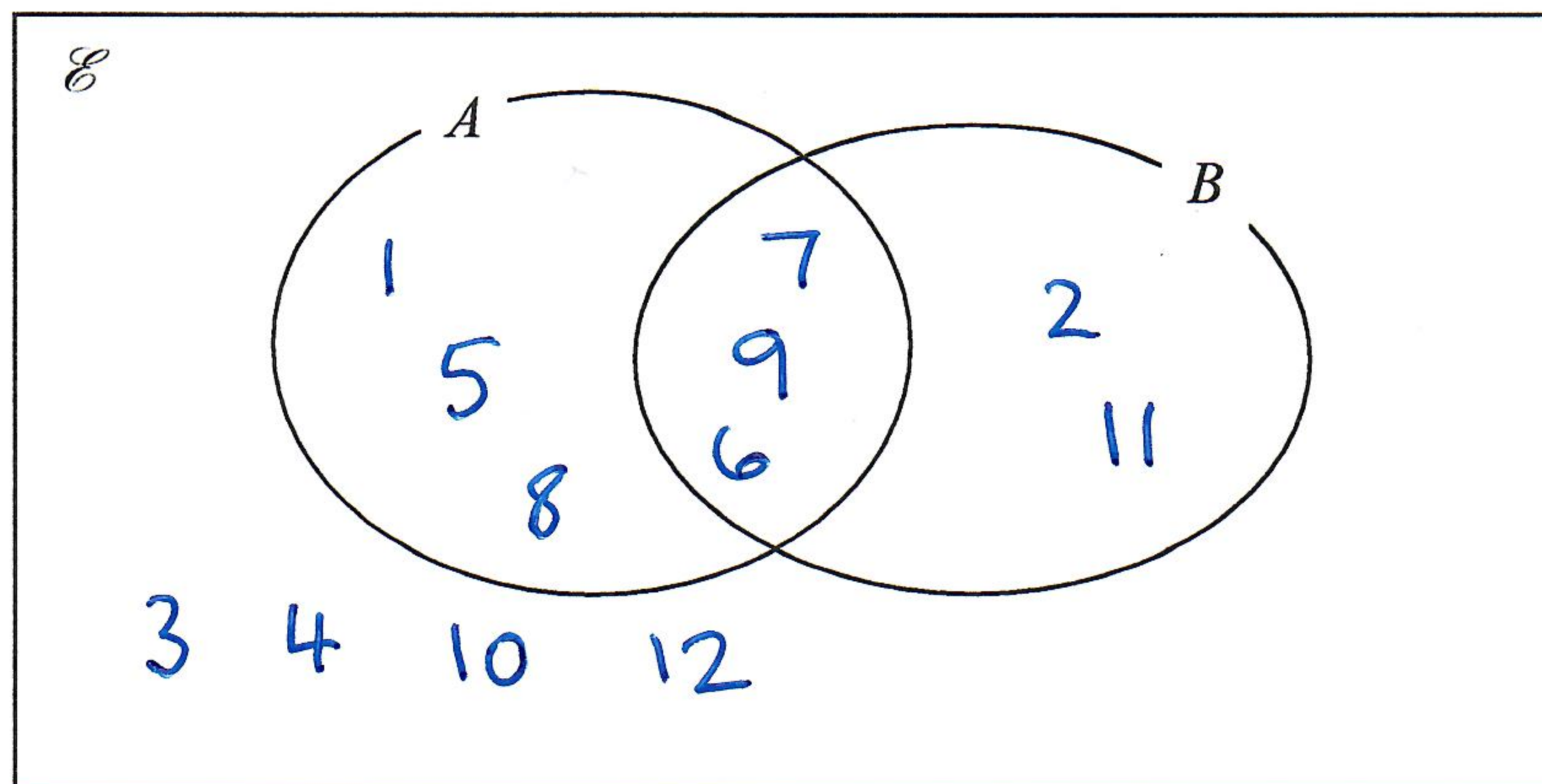
$$154 + 200 + 136.36 \dot{3} \dot{6} \approx 490 \text{ whole med. packs.}$$

490

(Total for Question 23 is 5 marks)



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



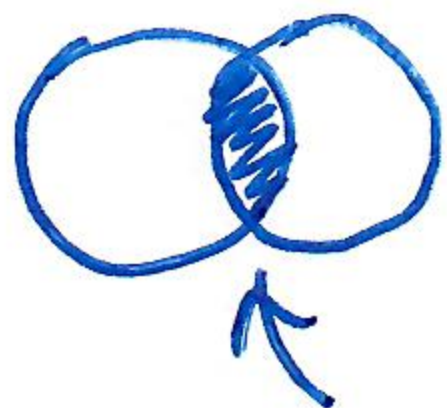
- (a) Complete the Venn diagram to represent this information.

(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



3 numbers
out of 12

$$\frac{3}{12} = \frac{1}{4} = 0.25$$

0.25

(2)

(Total for Question 24 is 5 marks)



25 Katy invests £200 000 in a savings account for 6 years.
The account pays compound interest at a rate of 3.5% per annum.

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

$$\text{Multiplier} \quad \frac{100 + 3.5}{100} = 1.035$$

$$\text{Compound Interest} = \text{Principal} \times \text{multiplier}^{\text{time}}$$

$$= 200\,000 \times 1.035^6$$

$$= 245\,851.0653$$

$$\text{Interest only} = 245\,851.0653 - 200\,000$$

$$= \text{£}45,851.07 \text{ (rounded to the nearest penny)}$$

£ 45851.07

(Total for Question 25 is 3 marks)

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA



26 The table shows information about the heights of 62 plants.

Midpoint	Height (h cm)	Frequency	Cumulative frequency
$\frac{10+20}{2} = 15$	$10 < h \leq 20$	12	12
$\frac{20+30}{2} = 25$	$20 < h \leq 30$	13	25
$\frac{30+40}{2} = 35$	$30 < h \leq 40$	8	33
45	$40 < h \leq 50$	17	50
55	$50 < h \leq 60$	13	63
65	$60 < h \leq 70$	9	72

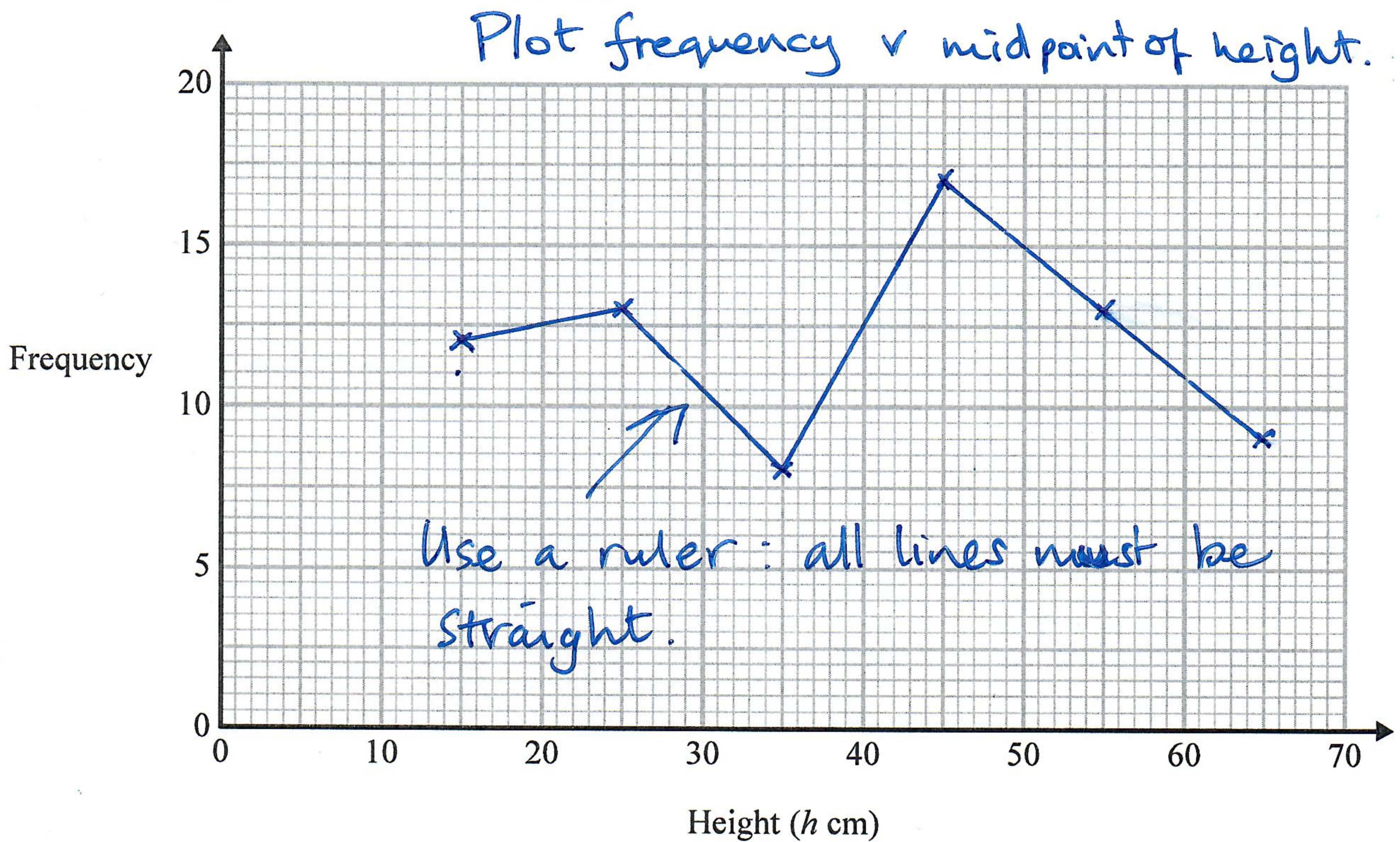
(a) Find the class interval that contains the median.

$$\frac{72}{2} = 36$$

The class with the 36th and 37th number in it is $40 < h \leq 50$

(1)

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

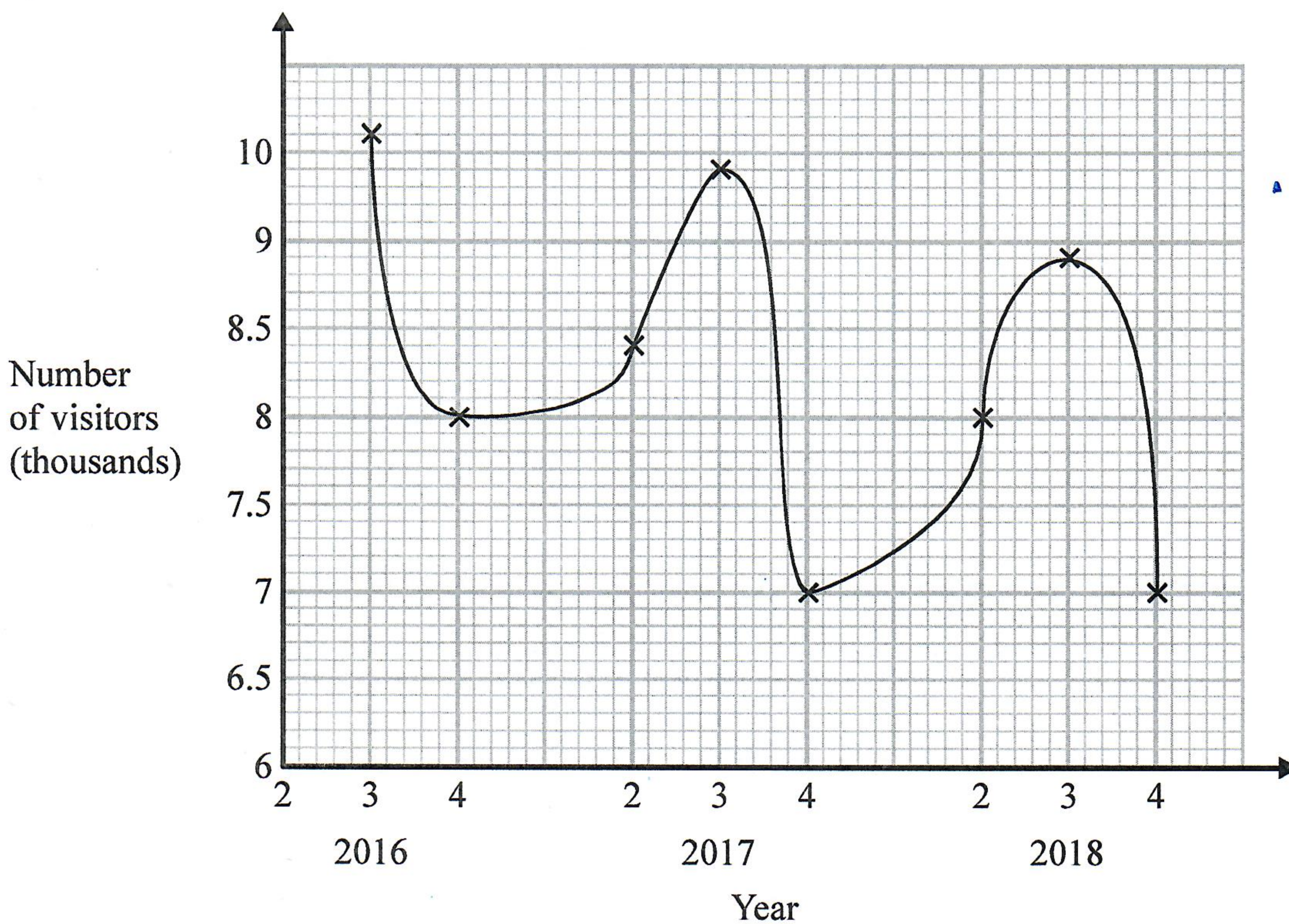


(2)

(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 Does not show first quarter of each year ie Spring.

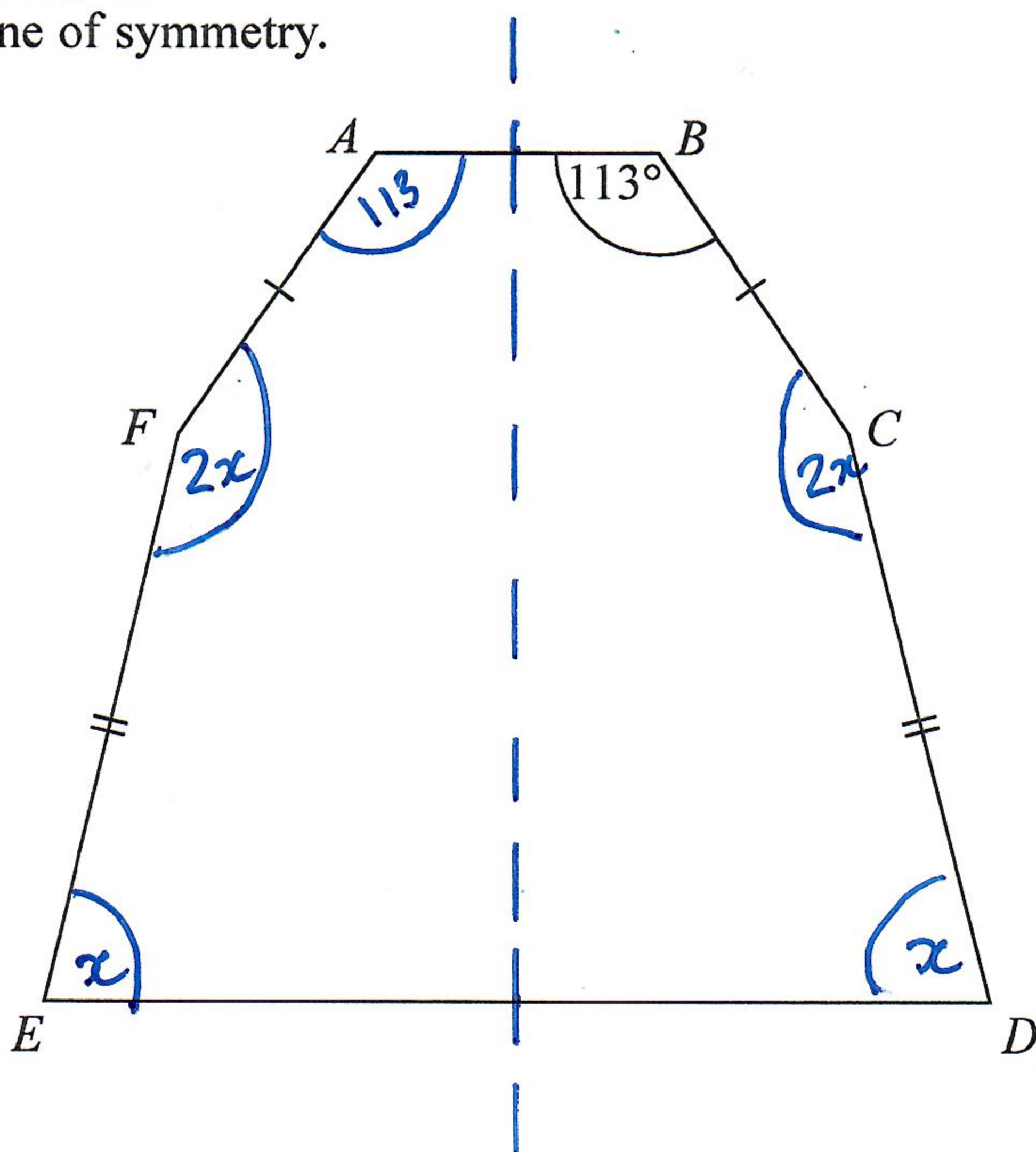
2 Missing 9.5 from the vertical axis.

3. Lines connecting the crosses should be straight.

(Total for Question 27 is 2 marks)



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



$$FA = BC$$

$$EF = CD$$

$$\text{Angle } ABC = 113^\circ$$

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

Work out the size of angle AFE .

You must show all your working.

$$\begin{aligned} \text{Interior Angles in a hexagon} &= 180(6-2) \\ &= 180 \times 4 \\ &= 720^\circ \end{aligned}$$

$$\text{Let angle } CDE = x$$

$$2x + x + x + 2x + 113 + 113 = 720$$

$$\begin{aligned} \therefore 6x + 226 &= 720 \\ -226 \quad \swarrow & \quad \searrow -226 \\ 6x &= 494 \\ \div 6 \quad \swarrow & \quad \searrow \div 6 \\ x &= 82\frac{1}{3} \end{aligned}$$

$$\angle AFE = 2x = 82\frac{1}{3} \times 2 = 164\frac{2}{3}$$

$$\underline{\underline{164\frac{2}{3}^\circ}}$$

(Total for Question 28 is 4 marks)

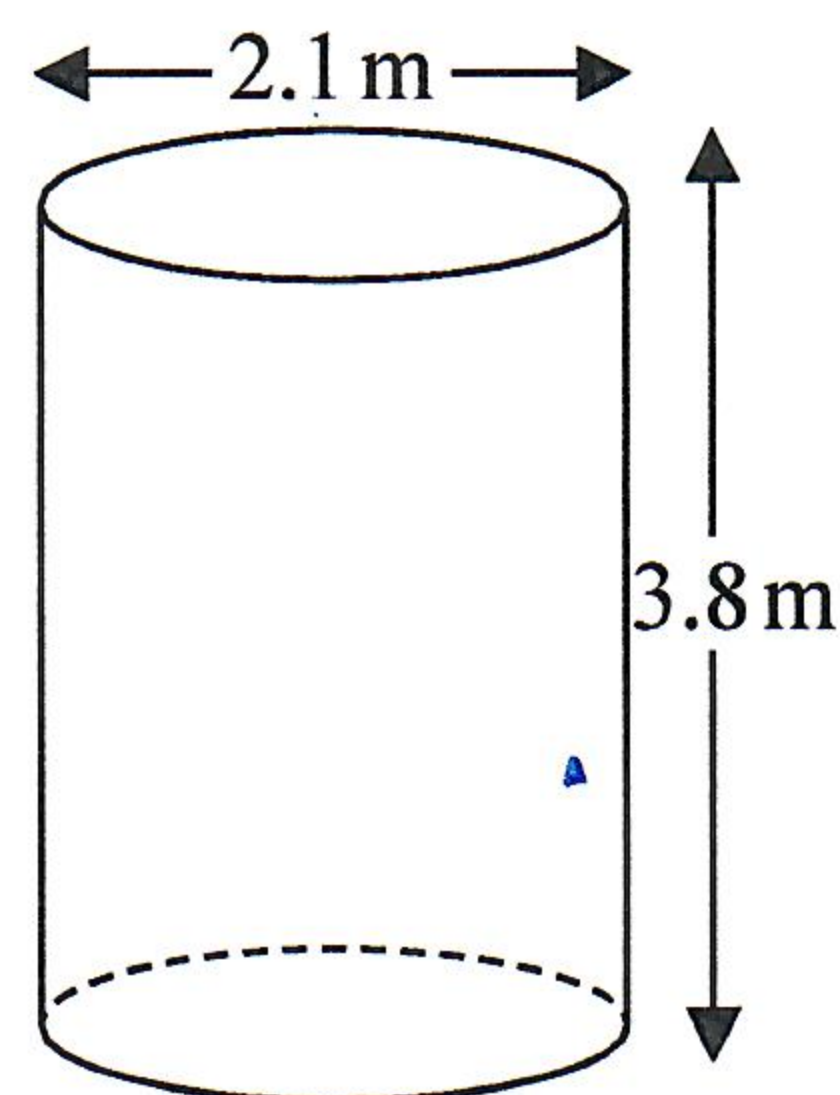


29 Jeremy has to cover 3 tanks completely with paint.

Each tank is in the shape of a cylinder with a top and a bottom.
The tank has a diameter of 2.1 m and a height of 3.8 m.

Jeremy has 9 tins of paint.
Each tin of paint covers 9 m^2

Has Jeremy got enough paint to cover completely the 3 tanks?
You must show how you get your answer.



$$\begin{aligned}\text{Circumference of tank} &= 2\pi r = \pi d \\ &= 2.1\pi \text{ m}\end{aligned}$$

$$\begin{aligned}\text{Area of sides of tank} &= 3.8 \times 2.1\pi \\ &= 7.98\pi\end{aligned}$$

$$\begin{aligned}\text{Area of top of tank} &= \pi r^2 \\ &= \pi \times 2.1^2 \\ &= 4.41\pi\end{aligned}$$

$$\begin{aligned}\text{Surface area of 1 tank} &= (4.41 + 4.41 + 7.98)\pi \text{ m}^2 \\ &= 16.8\pi \\ &\approx 52.77875658 \text{ m}^2\end{aligned}$$

$$\begin{aligned}\text{Total area of 3 tanks} &= 3 \times 52.77875658 \\ &= 158.3362697 \text{ m}^2 \\ &\approx 158.34 \text{ m}^2\end{aligned}$$

$$9 \text{ tins of paint covers } 9 \times 9 \text{ m}^2 = 81 \text{ m}^2$$

As $158.34 > 81$, Jeremy has not got enough paint.

No.

(Total for Question 29 is 5 marks)



30 Solve the simultaneous equations

Try to get
the y co-efficient
the same }^o multiply (ii) by 2

$$3x - 4y = 30 \quad \text{--- (i)}$$

$$4x + 2y = 18 \quad \text{--- (ii)}$$

+ 4y - 4y = 0
so add }^o Add (i) to (iii)

$$8x + 4y = 36 \quad \text{--- (iii)}$$

$$8x + 4y = 36$$

$$3x - 4y = 30$$

$$11x = 66$$

$$\therefore x = \frac{66}{11}$$

$$x = 6$$

Substitute x into (ii)

$$4x + 2y = 18$$

$$4(6) + 2y = 18$$

$$2y = 18 - 24$$

$$= -6$$

$$\therefore y = -3$$

Check in (i)

$$3x - 4y = 30$$

$$3(6) - 4(-3) = 30$$

$$x = \underline{6}$$

$$y = \underline{-3}$$

(Total for Question 30 is 3 marks)

$$18 - -12 = 30 \quad \text{TOTAL FOR PAPER IS 80 MARKS}$$

$$18 + 12 = 30$$

