



Surname _____

Forename(s) _____

Centre Number _____

Candidate Number _____

Candidate Signature _____

I declare this is my own work.

GCSE

MATHEMATICS

F

Foundation Tier Paper 2 Calculator

8300/2F

Wednesday 7 June 2023

Morning

Time allowed: 1 hour 30 minutes

At the top of the page, write your surname and forename(s), your centre number, your candidate number and add your signature.

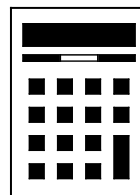
[Turn over]



MATERIALS

For this paper you must have:

- a calculator
- mathematical instruments
- the Formulae Sheet (enclosed).



INSTRUCTIONS

- Use black ink or black ball-point pen. Draw diagrams in pencil.
- Answer ALL questions.
- You must answer the questions in the spaces provided. Do not write on blank pages.
- If you need extra space for your answer(s), use the lined pages at the end of this book. Write the question number against your answer(s).
- Do all rough work in this book. Cross through any work you do not want to be marked.



INFORMATION

- The marks for questions are shown in brackets.
- The maximum mark for this paper is 80.
- You may ask for more answer paper, graph paper and tracing paper. These must be tagged securely to this answer book.

ADVICE

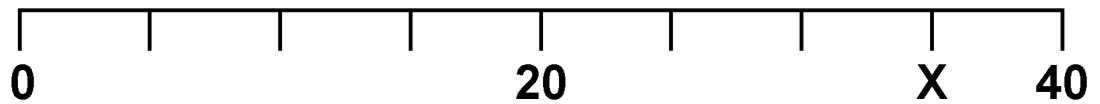
In all calculations, show clearly how you work out your answer.

DO NOT TURN OVER UNTIL TOLD TO DO SO



Answer ALL questions in the spaces provided.

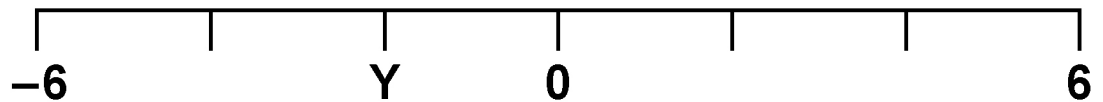
1(a) Here is a number line.



What number is at X? [1 mark]

Answer _____

1(b) Here is a different number line.

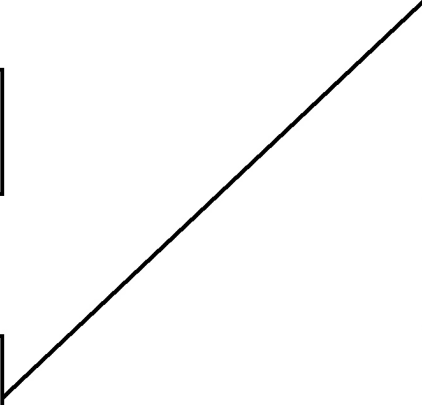


What number is at Y? [1 mark]

Answer _____

- 2 Match each expression on the left with the simplified expression on the right.

One has been done for you. [4 marks]

$3a + 4a$		$12a$
$14a - 2a$		$7a$
$3a \times 3a$		$3a$
$6 \times 3a$		$18a$
$12a \div 4$		$9a^2$
		$6a$

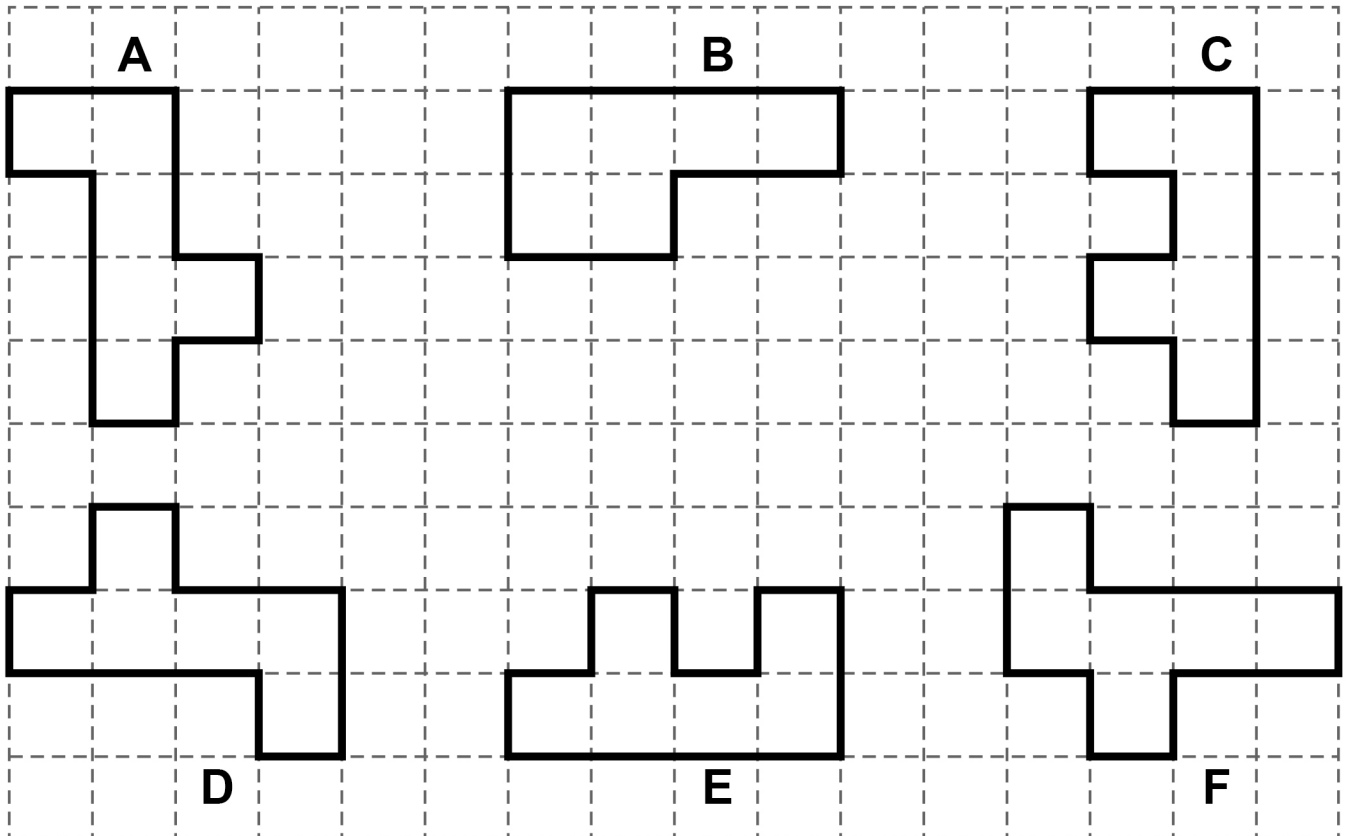
[Turn over]



3 Here are some shapes.

Each shape has an area of six square centimetres.

The diagram is not drawn accurately.



- 3(a) Which has the bigger perimeter, shape A or shape B?**

**You MUST show the lengths of both perimeters.
[2 marks]**

Answer _____

- 3 (b) Which shape is congruent to shape A? [1 mark]**

Answer _____

- 3(c) Which TWO shapes fit together to make a rectangle? [1 mark]**

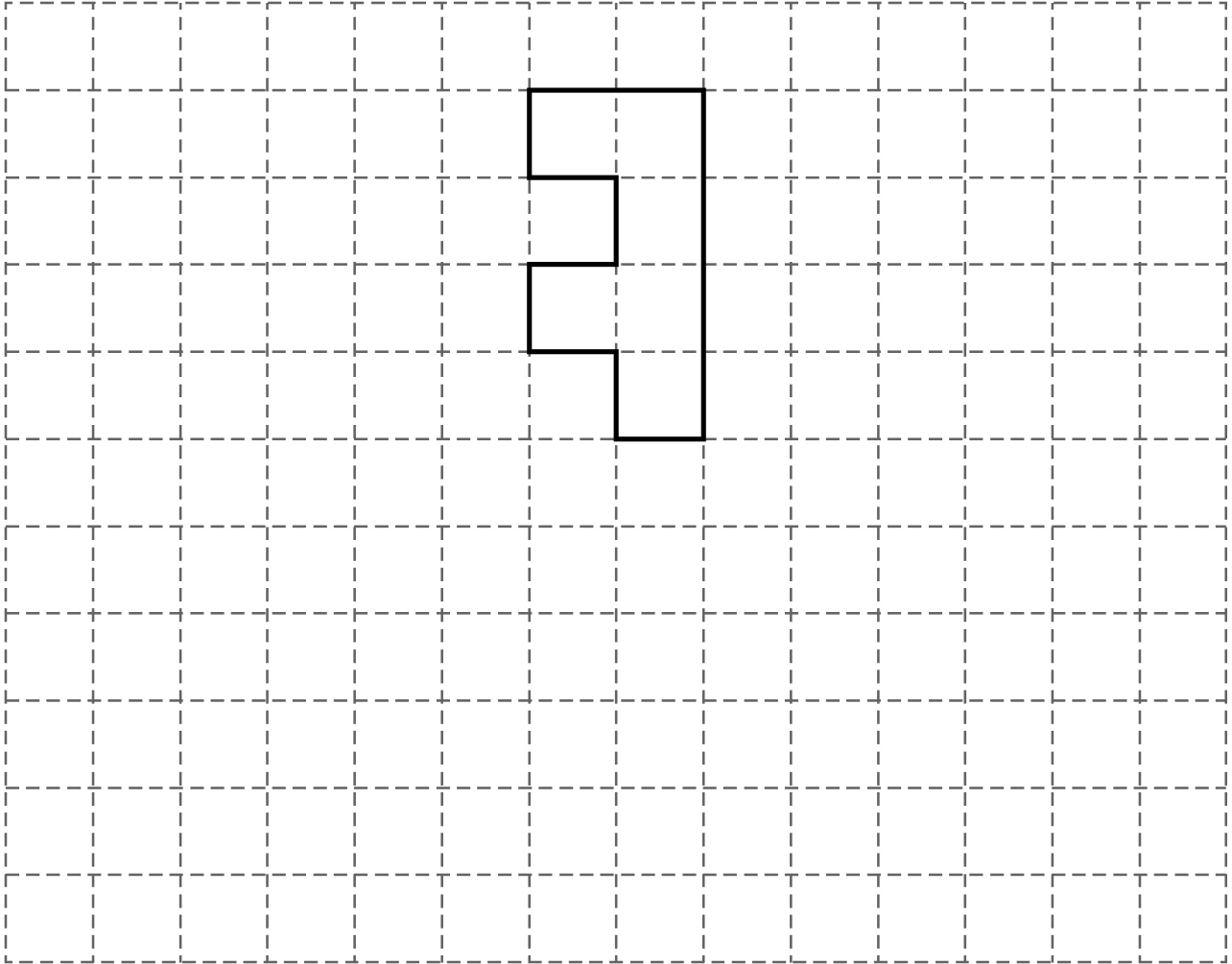
Answer _____ and _____

[Turn over]



3 (d) On this grid draw a reflection of shape C.

Show your mirror line. [2 marks]



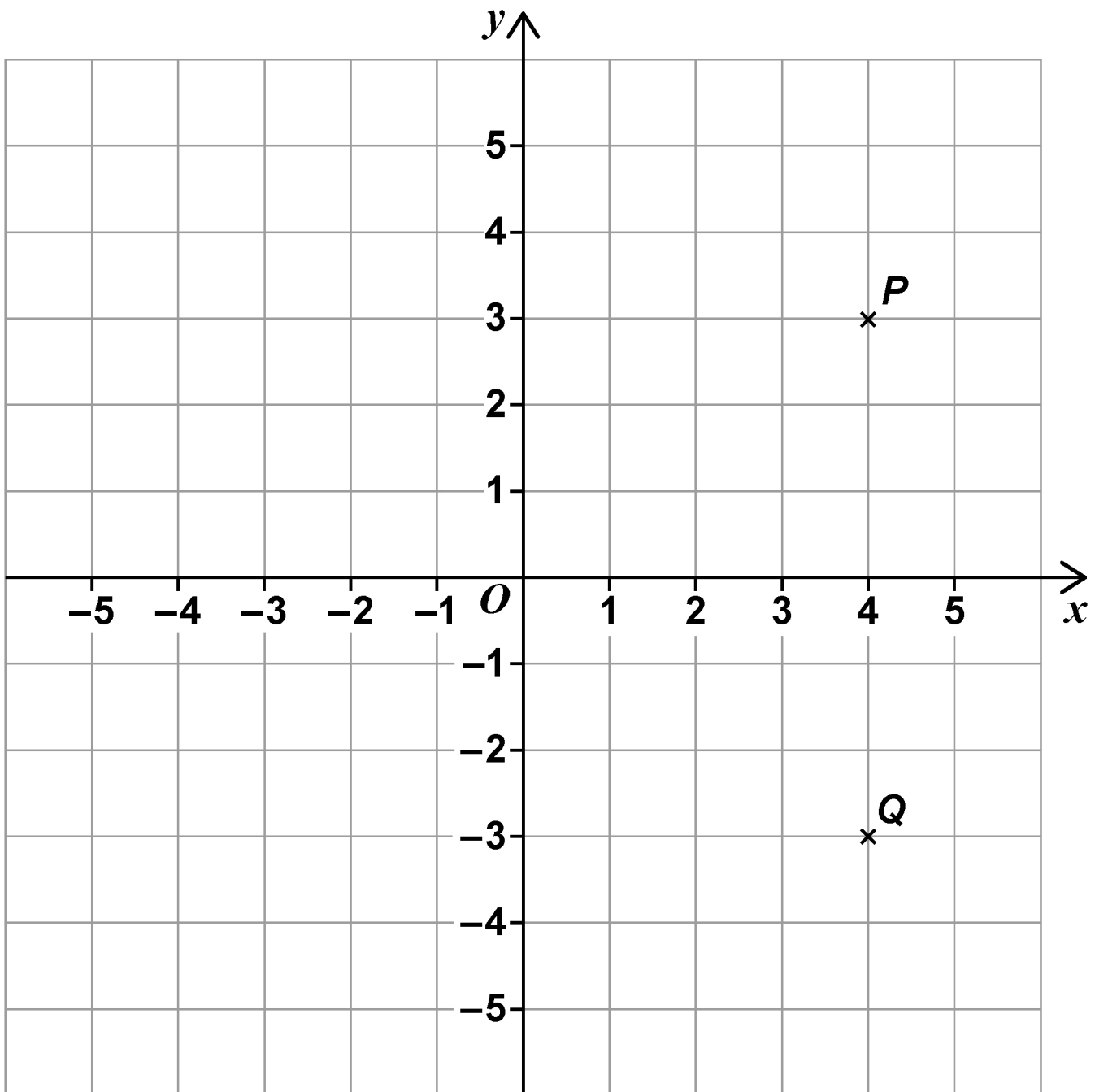
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6

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[Turn over]



4 Points P and Q are shown on the grid.



4(a) Write down the coordinates of P . [1 mark]

Answer (_____ , _____)



4(b) Angle PQR is a right angle.

Work out possible coordinates for R . [1 mark]

Answer (_____ , _____)

5(a) A shop sells bottles of orange juice.

Each bottle costs 75p

Work out the greatest number of bottles that can be bought with £5 [2 marks]

Answer _____

[Turn over]



5(b) Two shops sell bottles of apple juice.

SHOP X

pack of 4 bottles

Was £2.50

Now 10% off

SHOP Z

pack of 12 bottles

£7

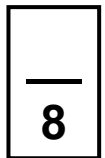
At which shop is it cheaper to buy 24 bottles?

Show working to support your answer. [4 marks]



Answer _____

[Turn over]



- 6 A game has four cards labelled A, B, C and D. Ellie picks two of the cards at random.

Complete the list of the SIX possible pairs of cards she could pick. [2 marks]

AB

- 7(a) Complete the boxes using
two DIFFERENT even numbers
and
two DIFFERENT odd numbers. [2 marks]

$$\square + \square + \square + \square = 46$$

[Turn over]



7(b) Complete the boxes using

a factor of 12

and

a factor of 40 [2 marks]

$$\square \times \square = 30$$

- 7 (c) Complete the boxes using
a square number
and
a prime number. [2 marks]

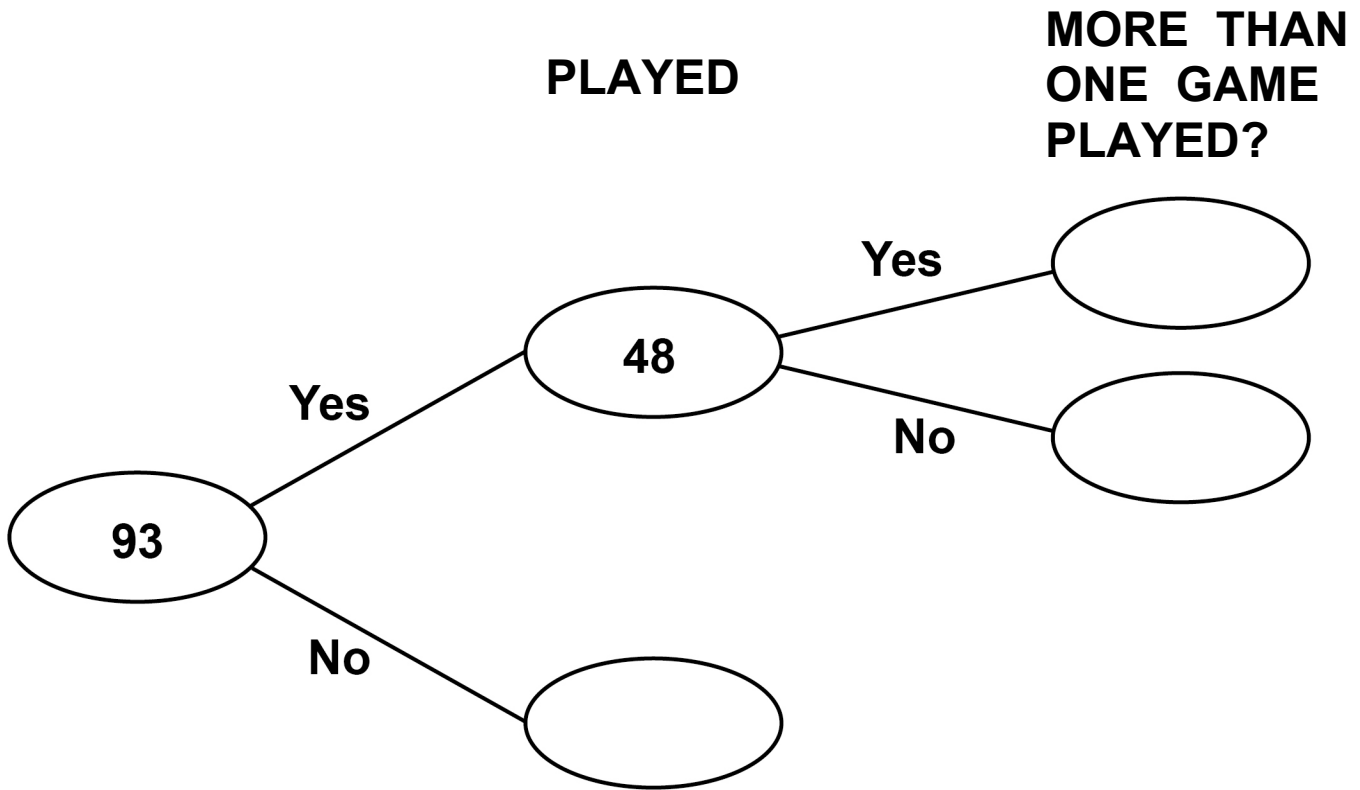
$$\square \div \square = 18$$

[Turn over]

8



- 8 93 people were asked if they played online games one day.
The frequency tree shows some information about their answers.



- 8 (a) 75% of the people who answered Yes played one game.

Complete the frequency tree. [3 marks]

8 (b) One of the 93 people is chosen at random.

$P(\text{used social media})$ is MORE THAN 0.68

What is the SMALLEST possible number of people who used social media? [2 marks]

Answer _____

[Turn over]

5



9 (a) The cost of a TV streaming service is

£6 per month for the first 4 months

then

£11 per month for the rest of the year.

Work out the TOTAL cost for the year. [2 marks]

Answer £ _____

9 (b) A TV series has ten episodes.

Nine episodes are each 50 minutes long.

One episode is 1 hour 42 minutes long.



Work out the TOTAL length of the series.

Give your answer in hours and minutes. [3 marks]

Answer

_____ hours _____ minutes

[Turn over]



10 (a) There are 1020 books in a box.

$\frac{2}{5}$ of the books are blue.

How many are blue? [2 marks]

Answer _____

10 (b) There are green pens and red pens in the box.

The ratio of green : red is 4 : 3

What fraction of the pens are green? [1 mark]

Answer _____



10 (c) There are some calculators in the box.

220 are scientific.

30 are not.

What percentage of the calculators are scientific? [2 marks]

Answer _____ **%**

[Turn over]

10

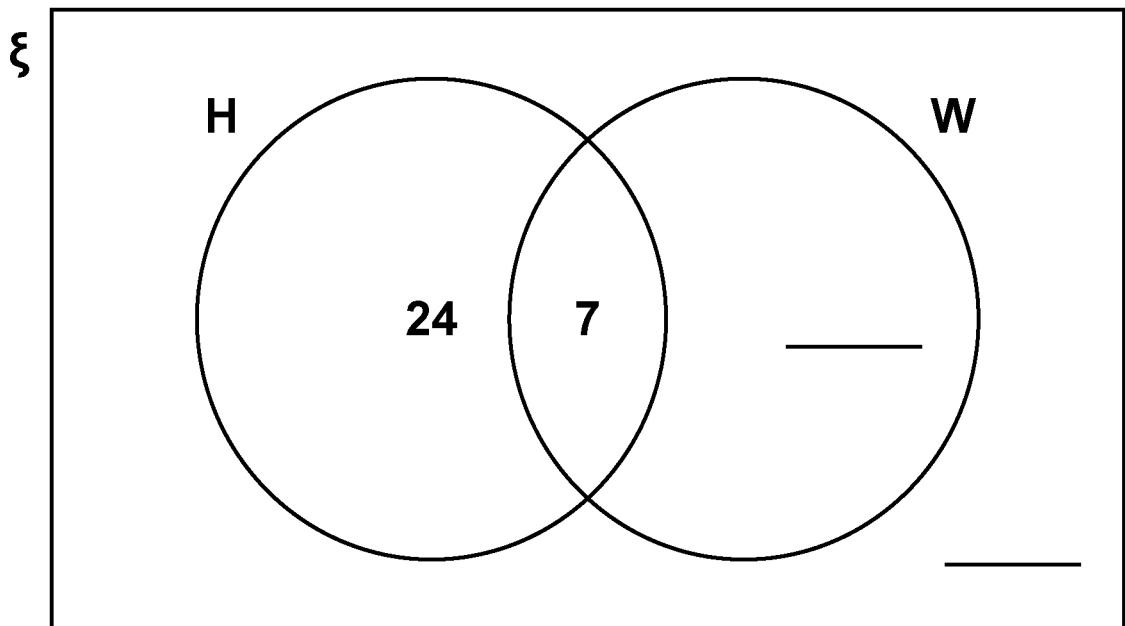


11 Here is a Venn diagram.

$\xi = 60$ people

H = people who own a gaming headset

W = people who own a smart watch



11 (a) 15 of the people own a smart watch.

Complete the Venn diagram. [2 marks]

11 (b) One of the 60 people is chosen at random.

What is the probability that they own BOTH a gaming headset and a smart watch? [1 mark]

Answer _____

[Turn over]



- 11 (c) Marek is going to buy a gaming headset that costs £35

He already has £19

He plans to save the rest in two equal amounts over the next two weeks.

He uses this method to work out in pounds how much to save each week.

$$35 - 19 \div 2$$

What is wrong with his method? [1 mark]

12 Kai says that $3 : 2$ is an equivalent ratio to $9 : 6$

Jo says that $1.5 : 1$ is an equivalent ratio to $9 : 6$

Who is correct?

Tick ONE box.

☐

Both of them

☐

Kai only

☐

Jo only

☐

Neither of them

Give reasons for your answer. [2 marks]

[Turn over]



13 28 is increased by 25%

40 is decreased by 15%

Which answer is bigger?

Show how you decide. [4 marks]

Answer _____

[Turn over]

—
6



14 Factorise $12a + 15b$ [1 mark]

Answer

15 Write down all the integers that satisfy the inequality

$$-3 \leq x < 2 \quad [2 \text{ marks}]$$

Answer



16 A linear sequence starts

7 10 13 16

Work out an expression for the n th term of the sequence. [2 marks]

Answer

[Turn over]



17 Jess saves 2p, 5p and 10p coins.

She has

- **45 10p coins**
- **8 times as many 2p coins as 10p COINS**
- **£17.70 in total.**

Work out

total VALUE of 2p coins : total VALUE of 5p coins

Give your answer in its simplest form. [4 marks]



[Turn over]

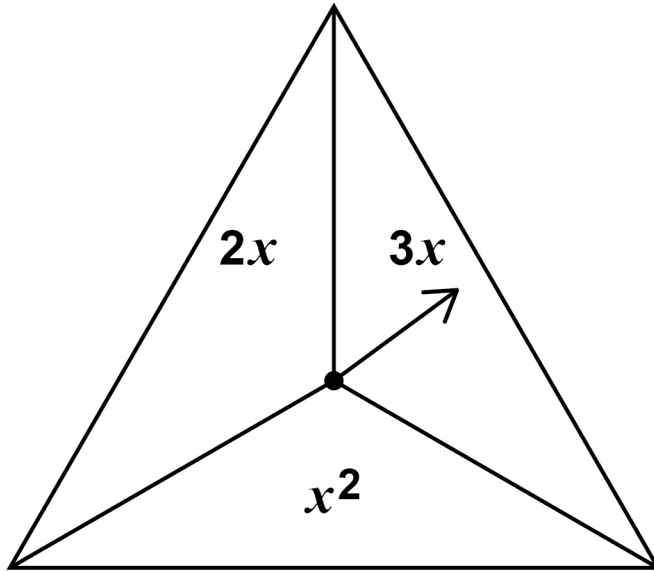
9



18

In a game,

- an ordinary fair six-sided dice is rolled
- the fair spinner shown is spun.



The score is the dice number **SUBSTITUTED** into the spinner expression.

- 18(a) Complete the table to show all of the possible scores. [2 marks]

	1	2	3	4	5	6
$2x$				8		
$3x$		6				
x^2					25	

- 18 (b) A player wins the game if their score is 10 or more.**

**Work out the probability that they win the game.
[1 mark]**

Answer _____

[Turn over]



18 (c) The game is played 711 times.

Estimate the number of games that are won.
[2 marks]

Answer

<hr/>
5

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[Turn over]



19 (a) Part of a regular polygon is shown.

The diagram is not drawn accurately.



Assume that the polygon is an octagon.

Work out the size of angle x . [2 marks]

Answer _____ °

- 19 (b) In fact, the polygon has MORE sides than an octagon.

What does this mean about the size of angle x ?

Tick ONE box. [1 mark]

☐

It is more than the answer to part (a)

☐

It is the same as the answer to part (a)

☐

It is less than the answer to part (a)

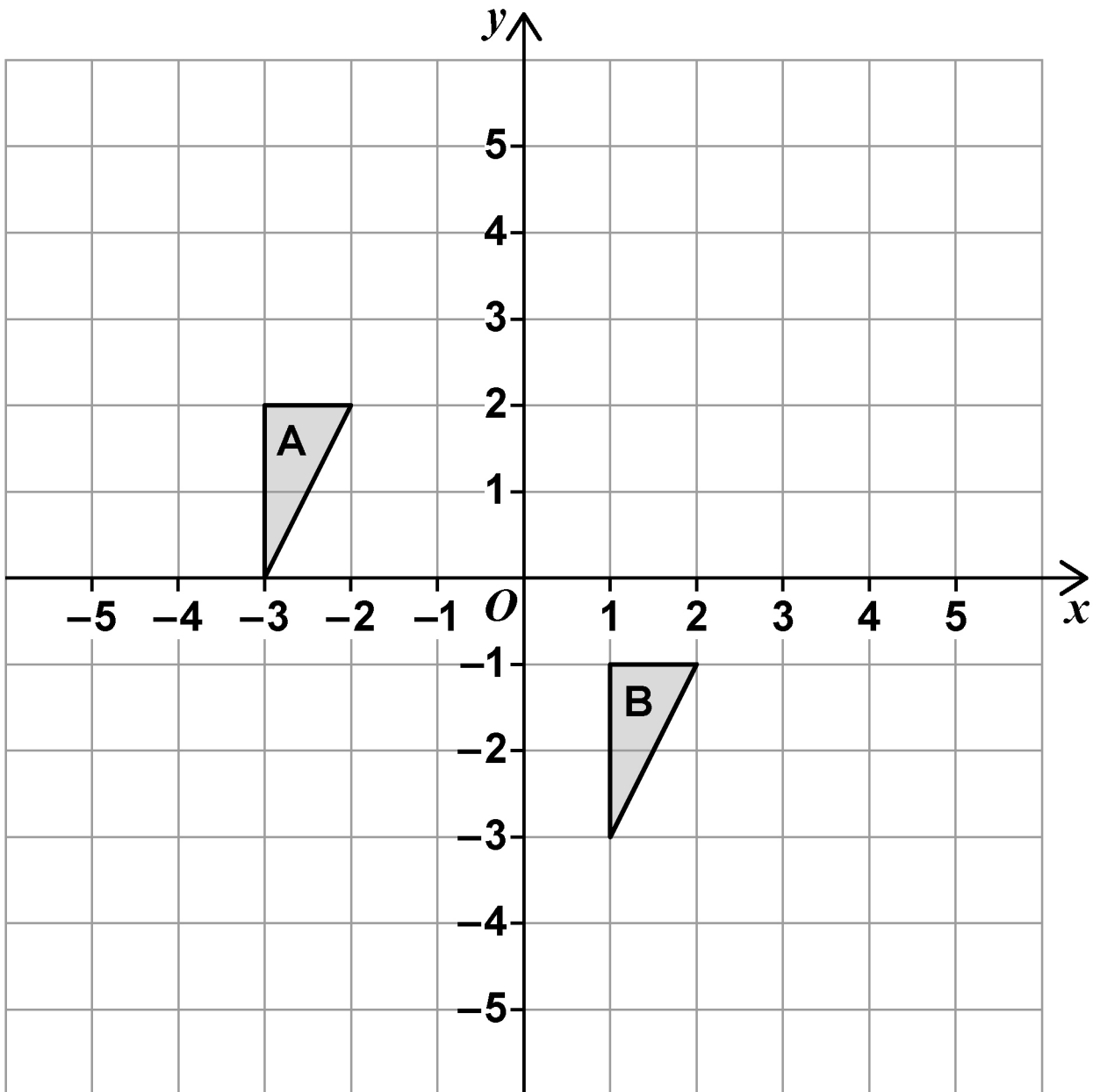
☐

It could be any of the above

[Turn over]



- 20 Write down the translation vector that maps shape A onto shape B. [2 marks]



Answer _____

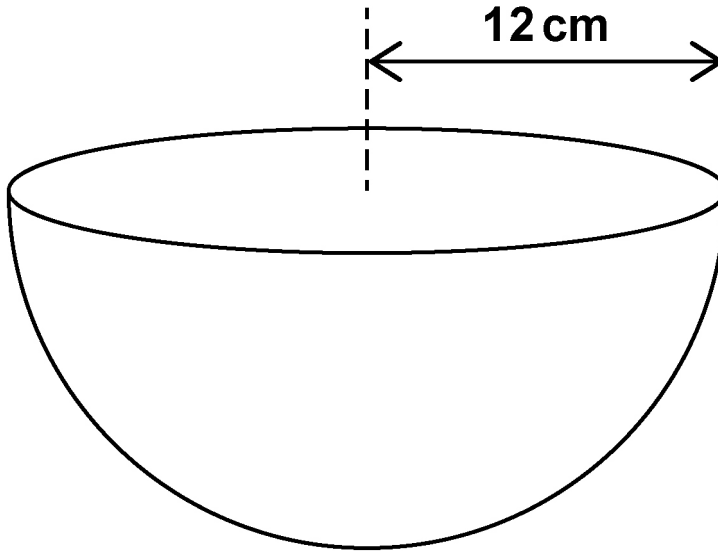
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5



21 Volume of a sphere = $\frac{4}{3} \pi r^3$

A bowl is a hemisphere with radius 12 cm



Water is poured into the bowl

at a rate of 325 cm^3 per second

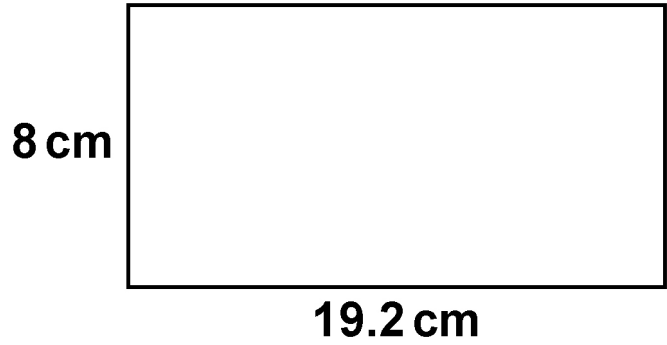
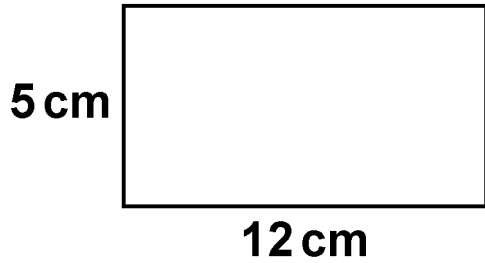
for 8 seconds.

Does the water fill MORE THAN 70% of the bowl?

You MUST show your working. [4 marks]

22 Show that these two rectangles are similar.

The diagrams are not drawn accurately. [2 marks]



23 A factory packs x boxes of teabags per hour.

Each box contains 80 teabags.

Show that the factory packs $\frac{4x}{3}$ teabags per minute. [2 marks]

END OF QUESTIONS

8



Additional page, if required.

Write the question numbers in the left-hand margin.

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Additional page, if required.

Write the question numbers in the left-hand margin.

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TOTAL	

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