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AQA

GCSE
MATHEMATICS

Foundation Tier   Paper 2 Calculator

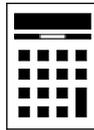**F**

Wednesday 7 June 2023   Morning   Time allowed: 1 hour 30 minutes

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.
- Fill in the boxes at the top of this page.
- Answer **all** questions.
- You must answer the questions in the spaces provided. Do not write outside the box around each page or 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.

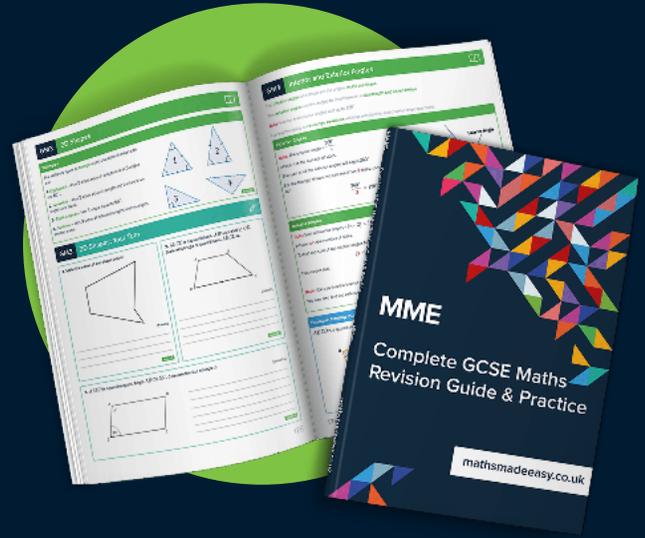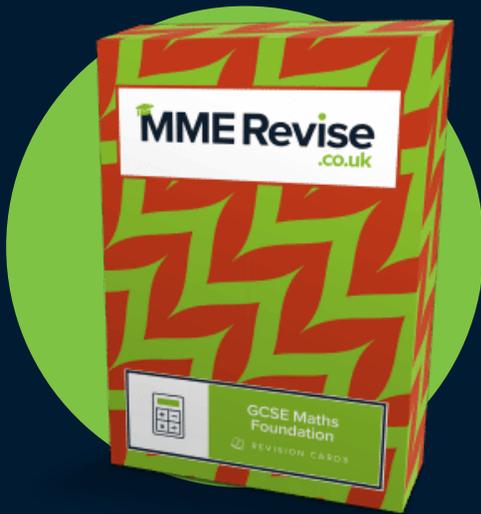| For Examiner's Use	
Pages	Mark
2–3	
4–5	
6–7	
8–9	
10–11	
12–13	
14–15	
16–17	
18–19	
20–21	
22–23	
24–25	
TOTAL	

MME.

GCSE Revision - GCSE Maths
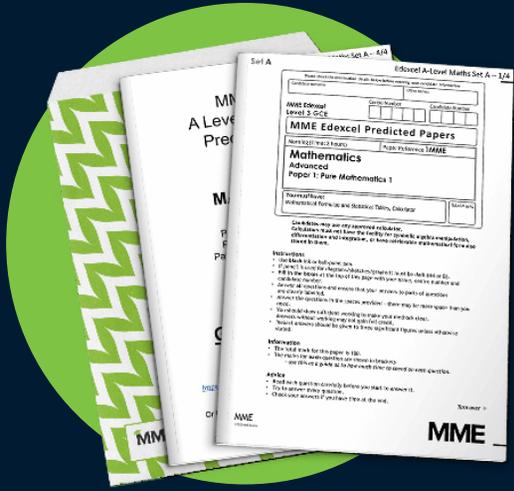
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Answer **all** questions in the spaces provided.

1 (a) Here is a number line.

0   5   10   15   20   25   30   X   40
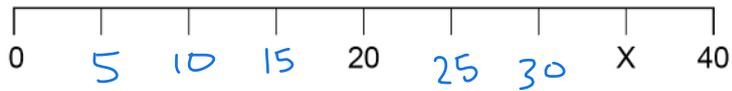
What number is at X?

[1 mark]

Answer   35

1 (b) Here is a different number line.

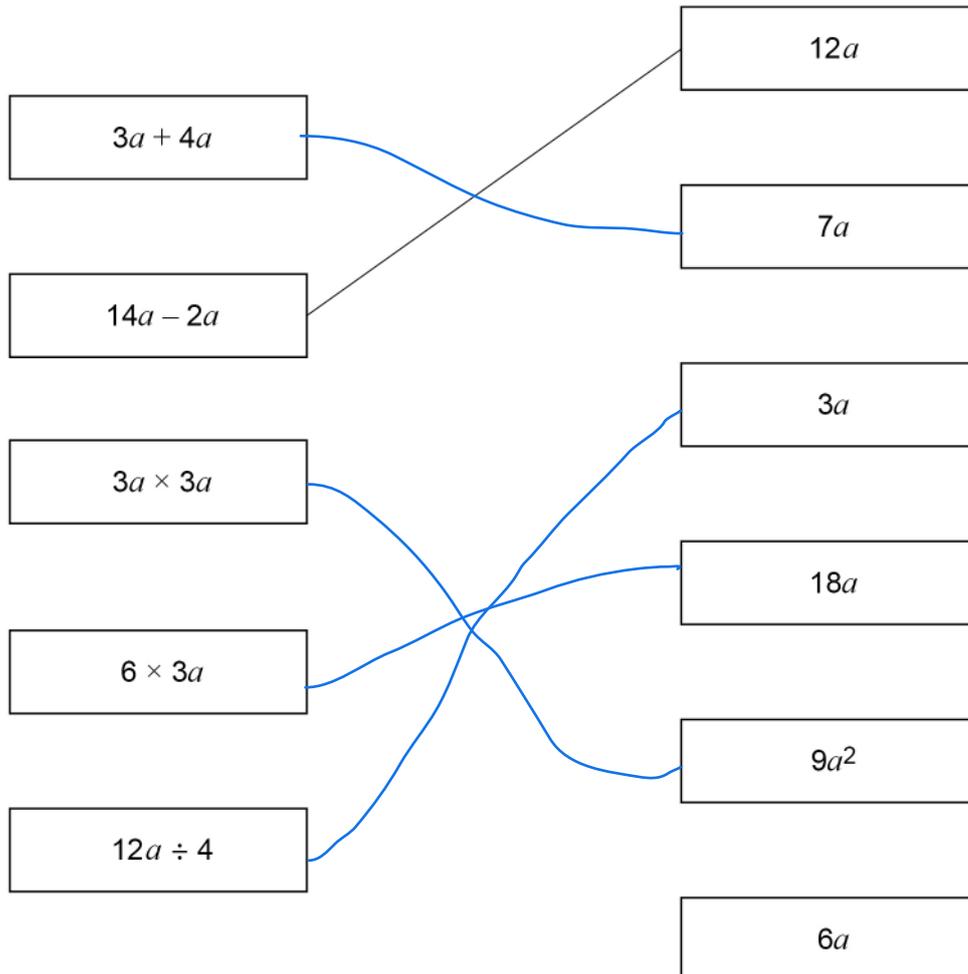−6   −4   Y   0   2   4   6
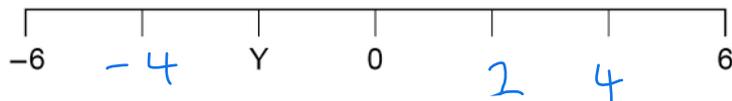
What number is at Y?

[1 mark]

Answer   −2

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

One has been done for you.

[4 marks]

$3a + 4a$

$14a - 2a$

$3a \times 3a$

$6 \times 3a$

$12a \div 4$

$12a$

$7a$

$3a$

$18a$

$9a^2$

$6a$

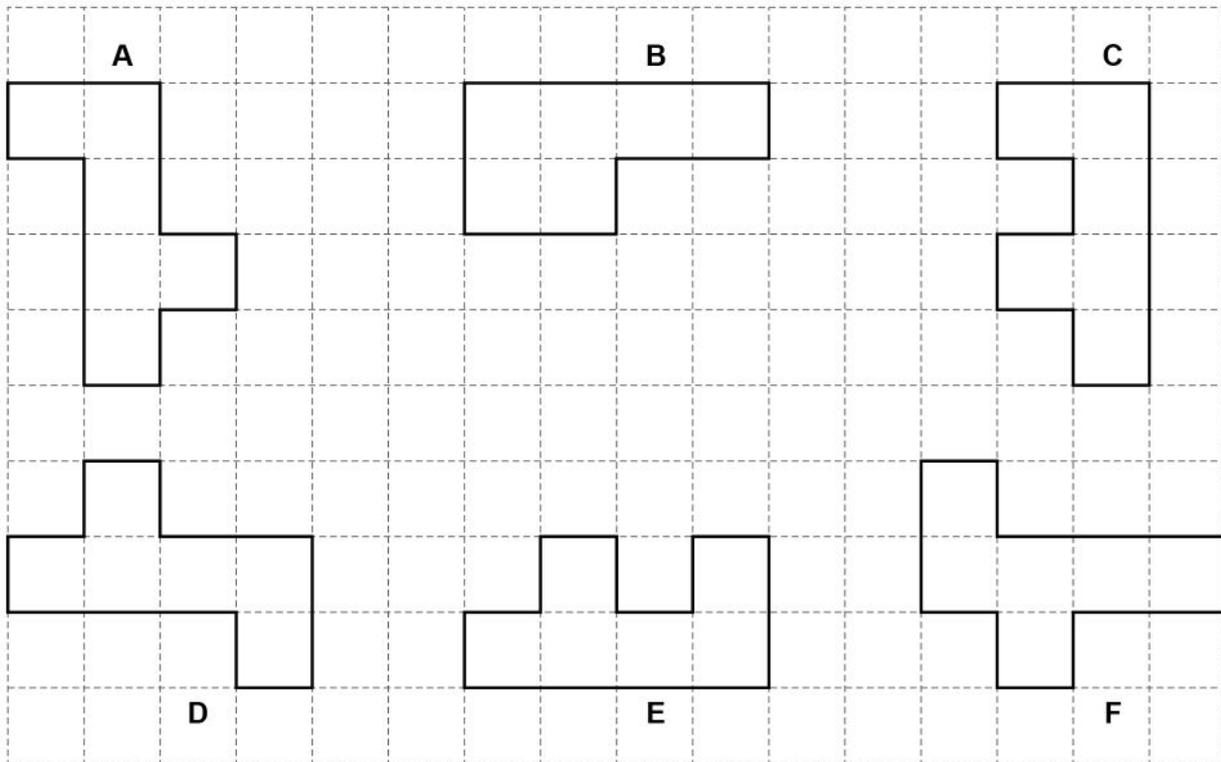**Turn over for the next question**

Turn over ▶

3 Here are some shapes.

Each shape has an area of six square centimetres.

A B C

D E F

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

You **must** show the lengths of both perimeters.

[2 marks]

A : 14 cm   B : 12 cm

Answer   A

3 (b) Which shape is congruent to shape **A**?

[1 mark]

Answer   D

3 (c) Which **two** shapes fit together to make a rectangle?

[1 mark]

Answer _____ C _____ and _____ E _____

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

Show your mirror line.

[2 marks]

Turn over for the next question

6
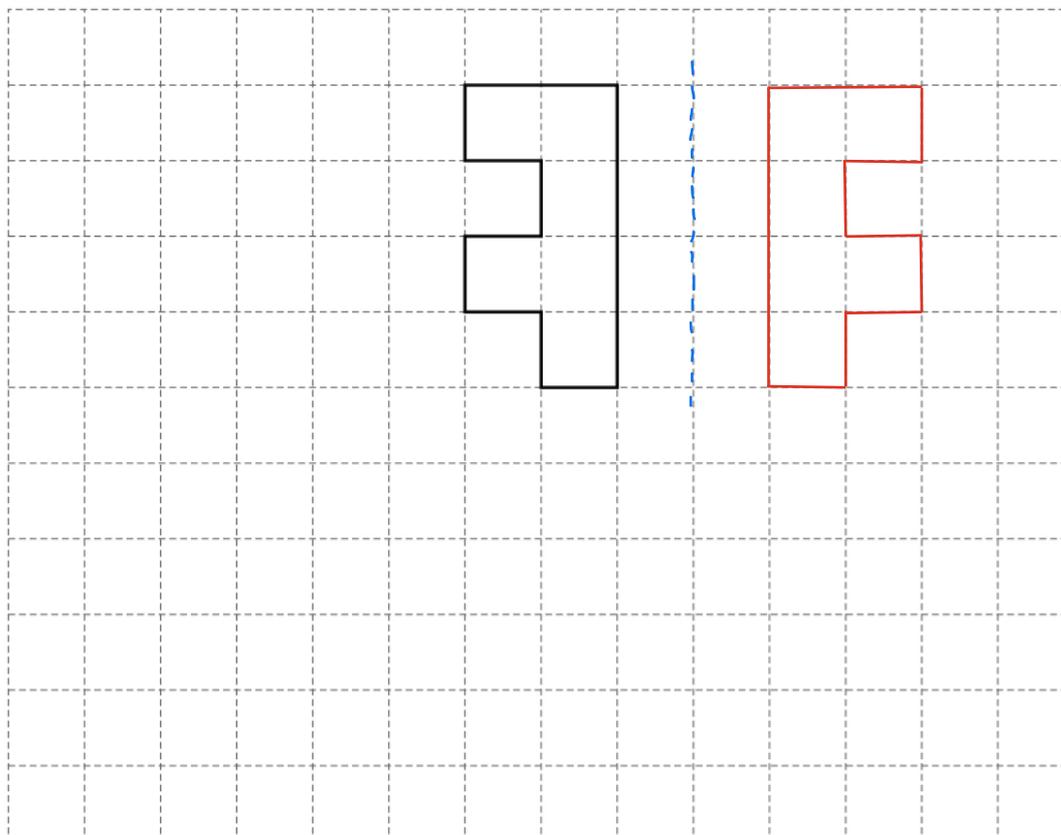
Turn over ▶

4 Points *P* and *Q* are shown on the grid.
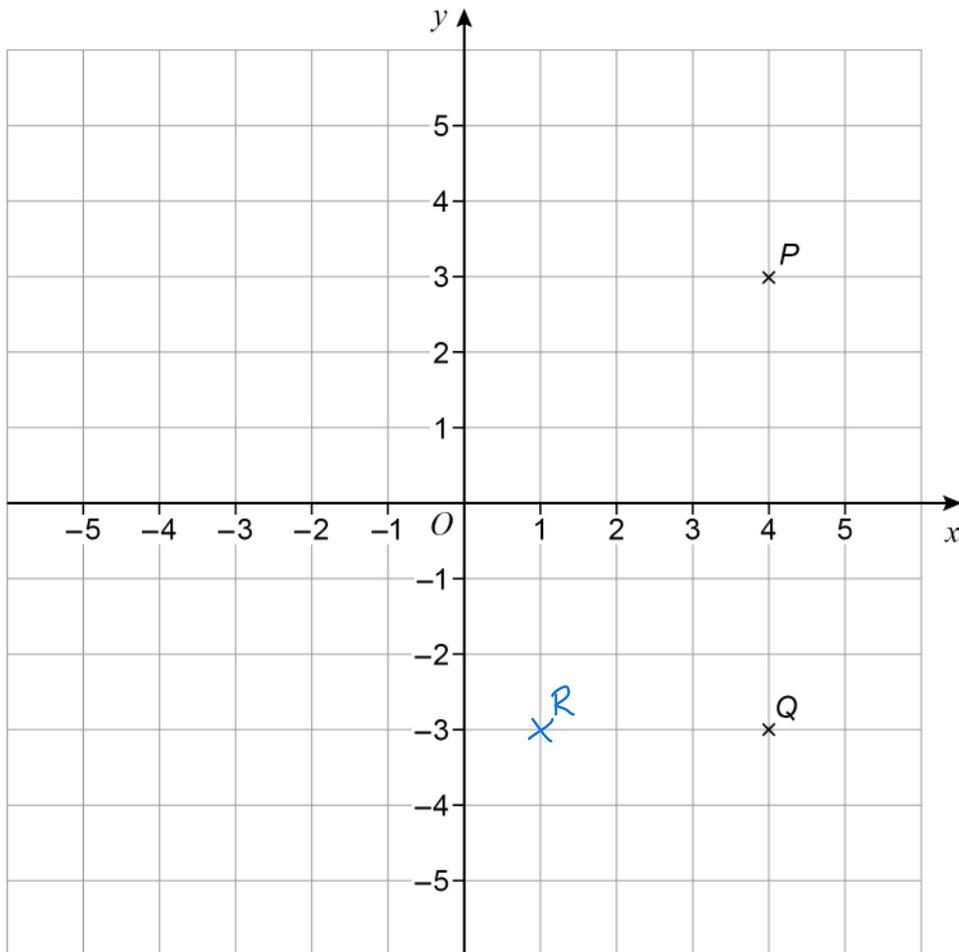
4 (a) Write down the coordinates of *P*.

[1 mark]

Answer (___4___ , ___3___)

4 (b) Angle *PQR* is a right angle.

Work out possible coordinates for *R*.

[1 mark]

Answer (___1___ , ___−3___)

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

Each bottle costs 75p = £0.75

Work out the greatest number of bottles that can be bought with £5

[2 marks]

$5 ÷ 0.75 = 6.666...$ bottles

so 6 whole bottles

Answer 6

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

Shop X	**Shop Z**
pack of 4 bottles	pack of 12 bottles
Was £2.50	£7
Now 10% off	

(So 90% left)

At which shop is it cheaper to buy 24 bottles?

Show working to support your answer.

[4 marks]

Shop X

£2.50 × 0.9 = £2.25

4 bottles cost £2.25   ×6
24 bottles cost £13.50 ×6

Shop Z

12 bottles cost £7   ×2
24 bottles cost £14   ×2

Answer Shop X

8

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
AC
AD
BC
BD
CD

7 (a) Complete the boxes using

two **different** even numbers

and

two **different** odd numbers.

[2 marks]

$$\boxed{11} + \boxed{8} + \boxed{6} + \boxed{21} = 46$$

7 (b) Complete the boxes using

a factor of 12

and

a factor of 40

[2 marks]

$$\boxed{3} \times \boxed{10} = 30$$

7 (c) Complete the boxes using
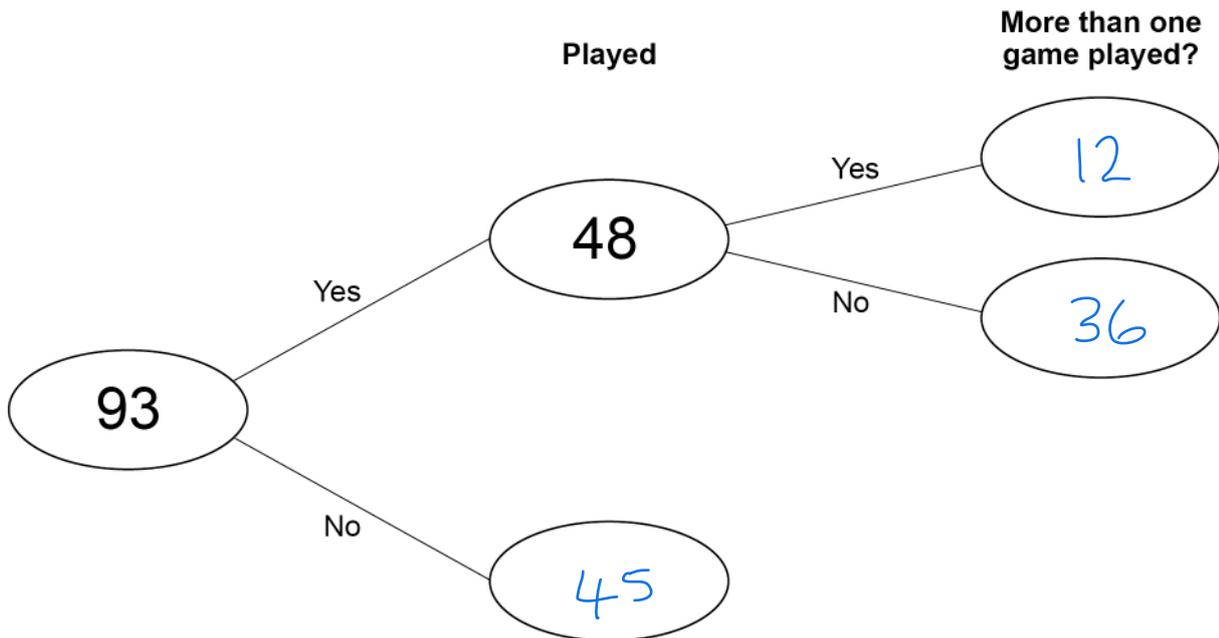
a square number

and

a prime number.

[2 marks]

$$\boxed{36} \div \boxed{2} = 18$$

Turn over for the next question

8

Turn over ▶

8 93 people were asked if they played online games one day.

The frequency tree shows some information about their answers.

Played

More than one
game played?

Yes — 12

48

No — 36

Yes

93

No

45

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(used social media) is **more than** 0.68

What is the **smallest** possible number of people who used social media?

[2 marks]

$0.68 \times 93 = 63.24$

So 64 people

Answer _____64_____

Turn over for the next question

5

Turn over ▶

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. _8 months_

Work out the **total** cost for the year.

[2 marks]

£6×4 + £11×8

£24 + £88

£112

Answer £ 112

9 **(b)** A TV series has ten episodes.

Nine episodes are each 50 minutes long.

One episode is 1 hour 42 minutes long. _60 + 42 = 102 mins_

Work out the **total** length of the series.

Give your answer in hours and minutes.

[3 marks]

9 × 50 = 450 mins

1 × 102 mins

total = 102 + 450 = 552 mins

552 ÷ 60 = 9.2 hrs

0.2 hrs = 0.2 × 60 mins = 12 mins

So 9 hrs 12 mins

Answer ___9___ hours ___12___ minutes

1 2

Do not write outside the box

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

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

How many are blue?

[2 marks]

$1020 \div 5 \times 2 = 408$

Answer _____408_____

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

The ratio of   green : red   is $\frac{4}{7} : \frac{3}{7}$

What fraction of the pens are green?

[1 mark]

Answer _____$\frac{4}{7}$_____

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

220 are scientific.

30 are not.

What percentage of the calculators are scientific?

[2 marks]

$220 + 30 = 250$ total
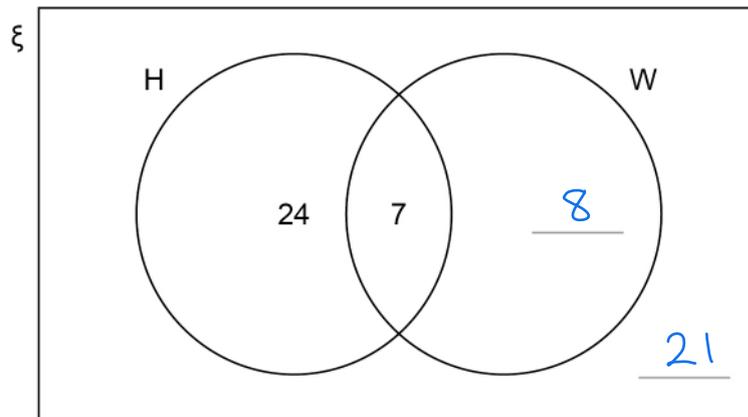
Scientific $= \frac{220}{250} \times 100 = 88\%$

Answer _____88_____ %

10

Turn over ▶

11 Here is a Venn diagram.

ξ = 60 people

H = people who own a gaming headset

W = people who own a smart watch

ξ

H   W

24   7   _8_

_21_

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

Complete the Venn diagram.

[2 marks]

15 − 7 = 8

60 − (24 + 7 + 8) = 21

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 $\dfrac{7}{60}$

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]

Needs brackets around 35-19

(35-19) ÷ 2

Turn over for the next question

4

Turn over ▶

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]

$\times 3 \left(\begin{array}{c} 3 : 2 \\ 9 : 6 \end{array} \right) \times 3$ $\times 6 \left(\begin{array}{c} 1.5 : 1 \\ 9 : 6 \end{array} \right) \times 6$

Both ratios are equivalent to 9:6

13   28 is increased by 25% $100\% + 25\% = 125\% = 1.25$

40 is decreased by 15% $100\% - 15\% = 85\% = 0.85$

Which answer is bigger?

Show how you decide.

[4 marks]

$28 \times 1.25 = 35$ $\longleftarrow$ bigger

$40 \times 0.85 = 34$

Answer _28 increased by 25%_

Turn over for the next question

6

Turn over ▶

14　　Factorise　　$12a + 15b$

[1 mark]

Answer　　$3(4a + 5b)$

15　　Write down all the integers that satisfy the inequality

$$-3 \leqslant x < 2$$

[2 marks]

Answer　　$-3, -2, -1, 0, 1$

16　　A linear sequence starts

7　　　　10　　　　13　　　　16

　　　　3　　　　3　　　　3

Work out an expression for the nth term of the sequence.

[2 marks]

Answer　　$3n + 4$

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]

45   10p coins worth 45 × 10p = 450p = £4·50

8 × 45 = 360 2p coins — worth 360 × 2 = 720p = £7·20

So £17·70 − £4·50 − £7·20 = £6 left

Must have £6 worth of 5p coins

Value of 2p coins : Value of 5p coins

£7·20   :   £6

÷120 (720 : 600) ÷120

6 : 5

Answer _____ 6 : 5 _____

18   In a game,

- an ordinary fair six-sided dice is rolled
- the fair spinner shown is spun.
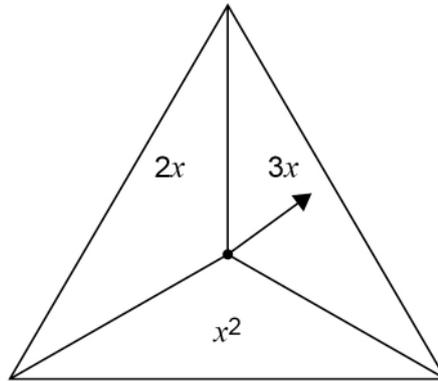
The score is the dice number **substituted** into the spinner expression.

18 (a)   Complete the table to show all of the possible scores.

[2 marks]

	1	2	3	4	5	6
$2x$	2	4	6	8	10	12
$3x$	3	6	9	12	15	18
x^2	1	4	9	16	25	36

18 (b)   A player wins the game if their score is 10 or more. — squares with red dot

Work out the probability that they win the game.

[1 mark]

8 possibilities for scoring 10 or more

18 possible scores

So $\frac{8}{18} = \frac{4}{9}$

Answer $\frac{4}{9}$

18 (c)   The game is played 711 times.

Estimate the number of games that are won.

[2 marks]

$\frac{4}{9} \times 711 = 316$

Answer   316

Turn over for the next question

5

Turn over ▶

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

Not drawn
accurately

Assume that the polygon is an octagon. — 8 sides

Work out the size of angle x.

[2 marks]

$360 \div 8 = 45°$

Answer _____ 45 °

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]

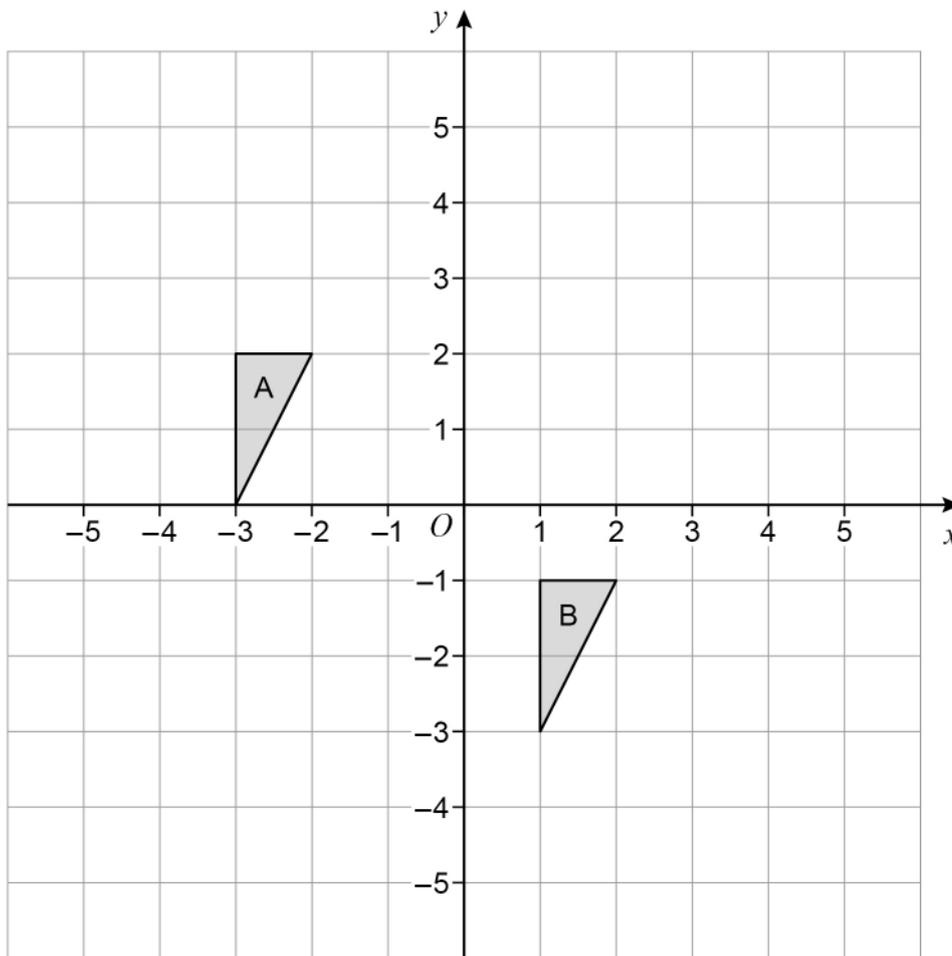☐   It is more than the answer to part (a)

☐   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

20 Write down the translation vector that maps shape A onto shape B.

[2 marks]

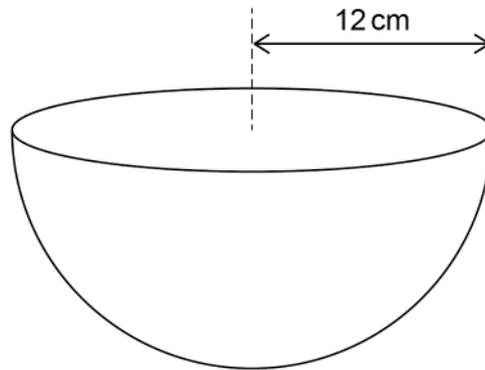Answer $\begin{pmatrix} 4 \\ -3 \end{pmatrix}$

Turn over for the next question

5

Turn over ▶

21

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

A bowl is a hemisphere with radius 12 cm

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]

Volume of sphere = $\frac{4}{3} \times \pi \times 12^3$ = 2304π

So volume of hemisphere bowl = $\frac{2304\pi}{2}$ = 1152π

70% of volume of bowl is $1152\pi \times 0.7$ = 2533.38 cm^3
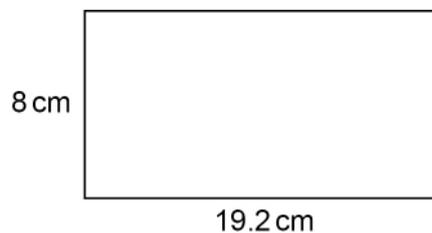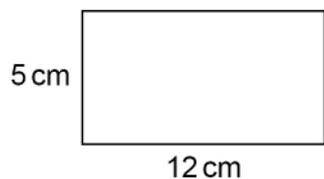
Amount of water = 325×8 = 2600 cm^3

Yes, this is more than 70% of the bowl

22 Show that these two rectangles are similar.

[2 marks]

Not drawn accurately

5 cm

12 cm

8 cm

19.2 cm

$8 \div 5 = 1.6$

$19.2 \div 12 = 1.6$ so sides are in same proportion

23 A factory packs x boxes of teabags per hour.

Each box contains 80 teabags.

Show that the factory packs $\dfrac{4x}{3}$ teabags per minute.

[2 marks]

$80 \times x = 80x$ teabags per hour
$\div 60$ $\dfrac{80x}{60}$ teabags per minute $\div 60$

$= \dfrac{8x}{6}$

$= \dfrac{4x}{3}$

END OF QUESTIONS

8