

Please write clearly in block capitals.

Centre number

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Candidate number

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Surname

Forename(s)

Candidate signature

I declare this is my own work.

GCSE MATHEMATICS

Example-Problem Past Paper

F

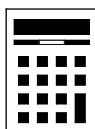
Foundation Tier Paper 2 Calculator

June 2023

Materials

For this paper you must have:

- a calculator
- mathematical instruments.



First Half

Instructions

- Engage with the fully-worked solutions in full before attempting the shadow questions.
- Explain the fully-worked solutions to yourself, anticipating the next steps in the worked solutions, making links between the problems and the mathematics used to solve them.
- Apply the methods learnt from the fully-worked solutions to the shadow questions, writing down all workings in the spaces provided. Your thought process is important.
- Do all rough work in this book.

Information

- The marks for questions are shown in brackets.
- You may ask for more answer paper, graph paper and tracing paper.
- You should ask your teacher for help on a question if you do not understand a part of the fully-worked solution. Remember to be specific, understanding why the step was completed, rather than simply getting the correct answer.

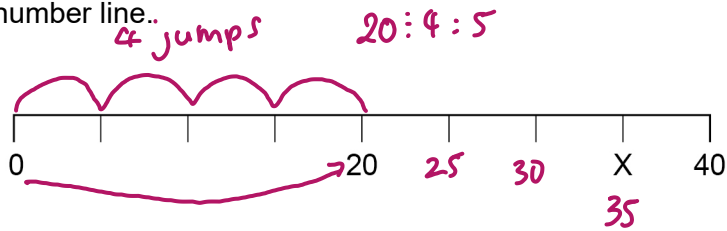
Advice

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

Where a calculator has been used, show clearly what you entered into the calculator.

Answer **all** questions in the spaces provided.

1 (a) Here is a number line..

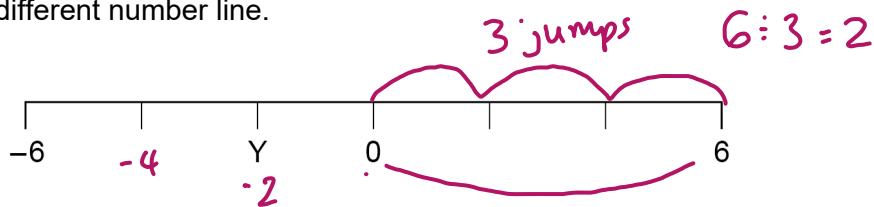


What number is at X?

[1 mark]

Answer 35

1 (b) Here is a different number line.



What number is at Y?

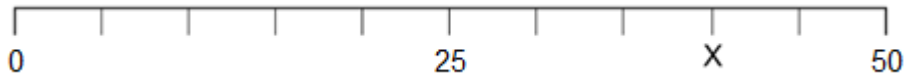
[1 mark]

Answer -2

Answer **all** questions in the spaces provided.

Do not write
outside the
box

- 1 (a) Here is a number line.

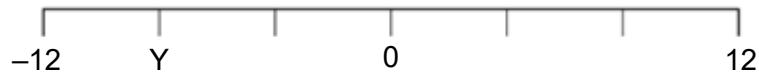


What number is at X?

[1 mark]

Answer _____

- 1 (b) Here is a different number line.



What number is at Y?

[1 mark]

Answer _____

Turn over ►

2

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

One has been done for you.

[4 marks]

Left column expressions:

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

Right column expressions:

- $12a$
- $7a$
- $3a$
- $18a$
- $9a^2$
- $6a$

Handwritten matches (pink lines):

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

2

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

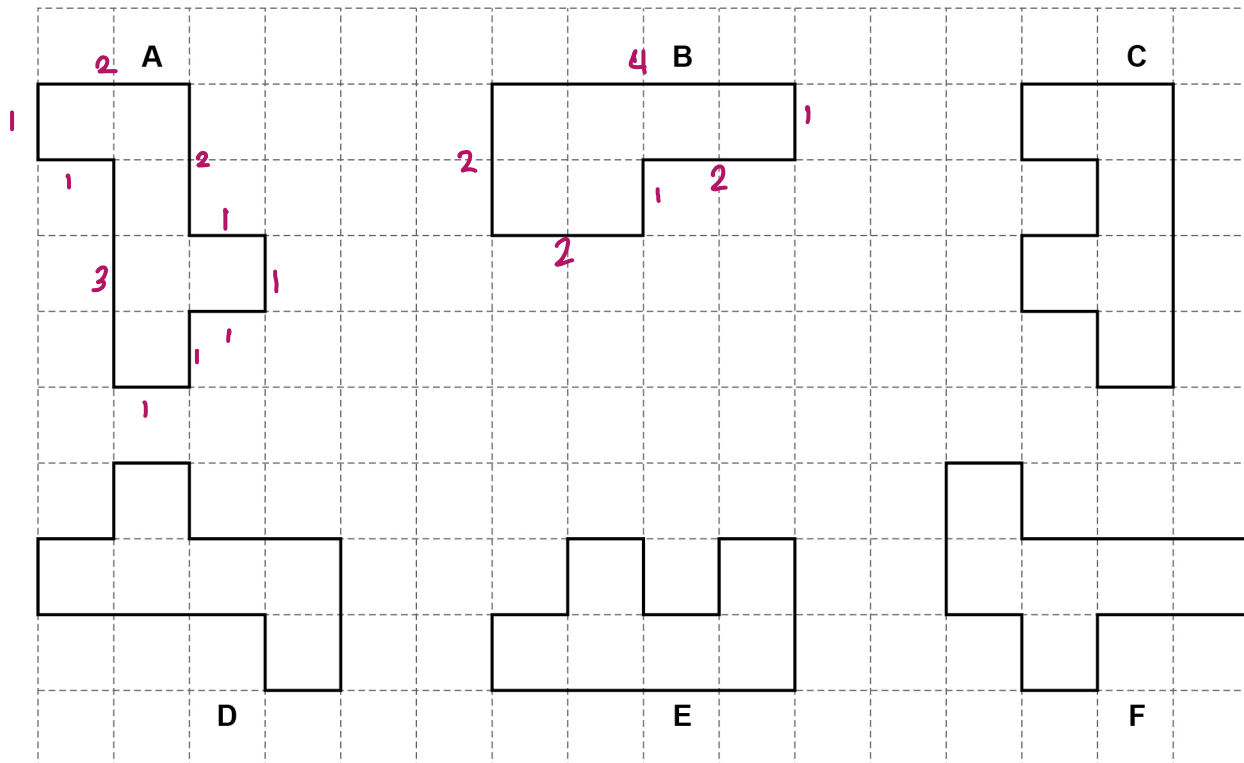
One has been done for you.

[4 marks]

$4y + 5y$	$14y$
$16y - 2y$	$25y^2$
$5y \times 5y$	$5y$
$7 \times 3y$	$9y$
$15y \div 3$	$21y$
	$25y$

Turn over ►

- 3 Here are some shapes.
Each shape has an area of six square centimetres.



- 3 (a) Which has the bigger perimeter, shape **A** or shape **B**?
You **must** show the lengths of both perimeters.

[2 marks]

$$\text{Perimeter A} = 2 + 2 + 1 + 1 + 1 + 1 + 1 + 3 + 1 + 1 = 14$$

$$\text{Perimeter B} = 4 + 1 + 2 + 1 + 2 + 2 = 12$$

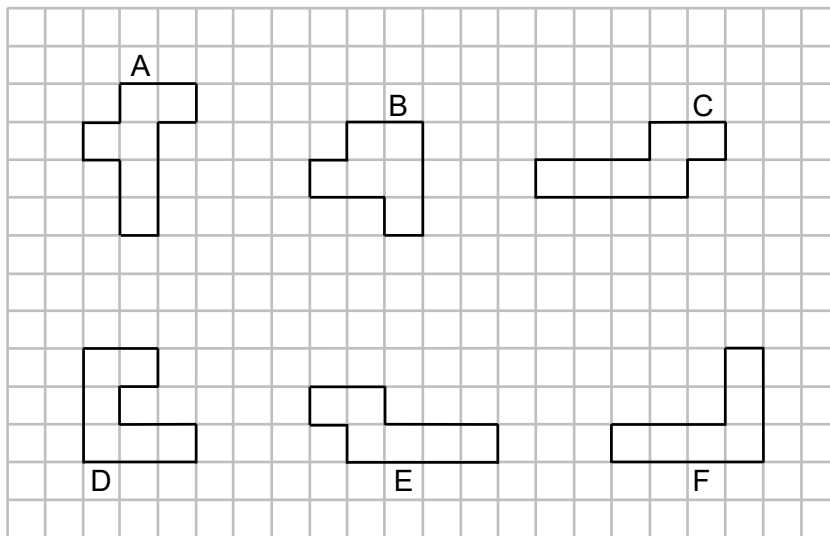
Answer A

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

[1 mark]

Answer D

- 3** Here are some shapes.
Each shape has an area of six square centimetres.



- 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 **C**?

[1 mark]

Answer _____

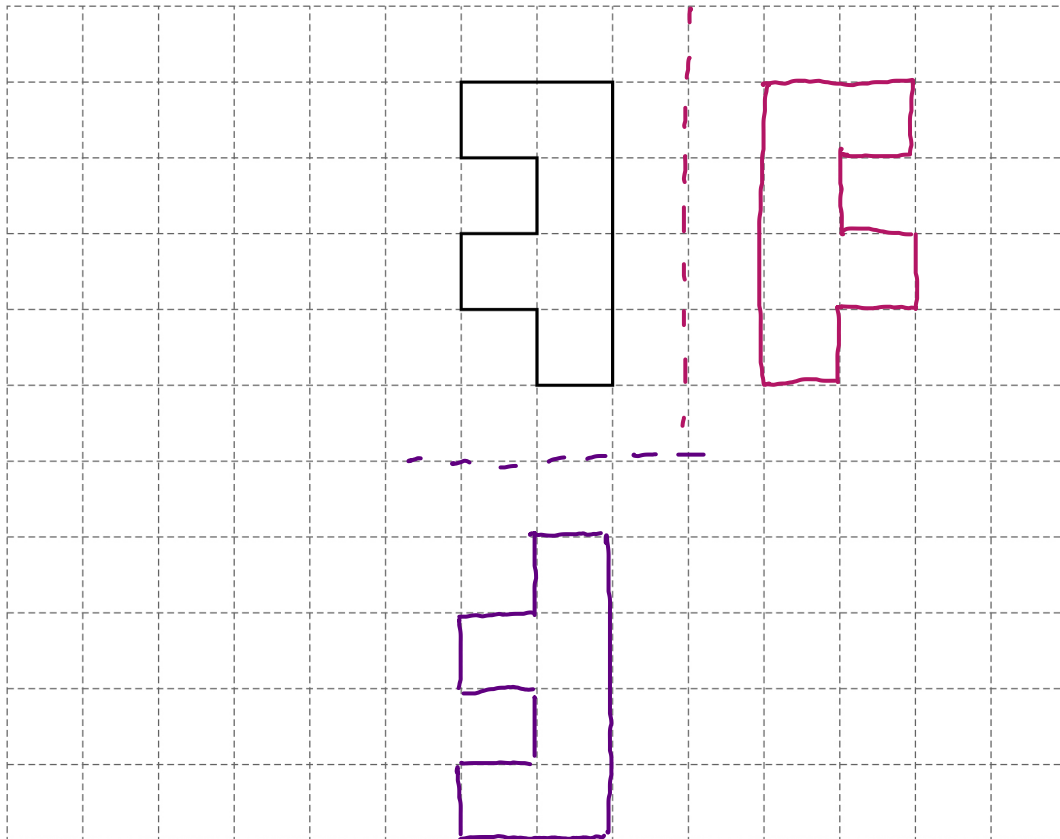
- 3 (c) Which **two** shapes fit together to make a rectangle?

[1 mark]

Answer C and E

- 3 (d) On this grid draw a reflection of shape C.
Show your mirror line.

[2 marks]



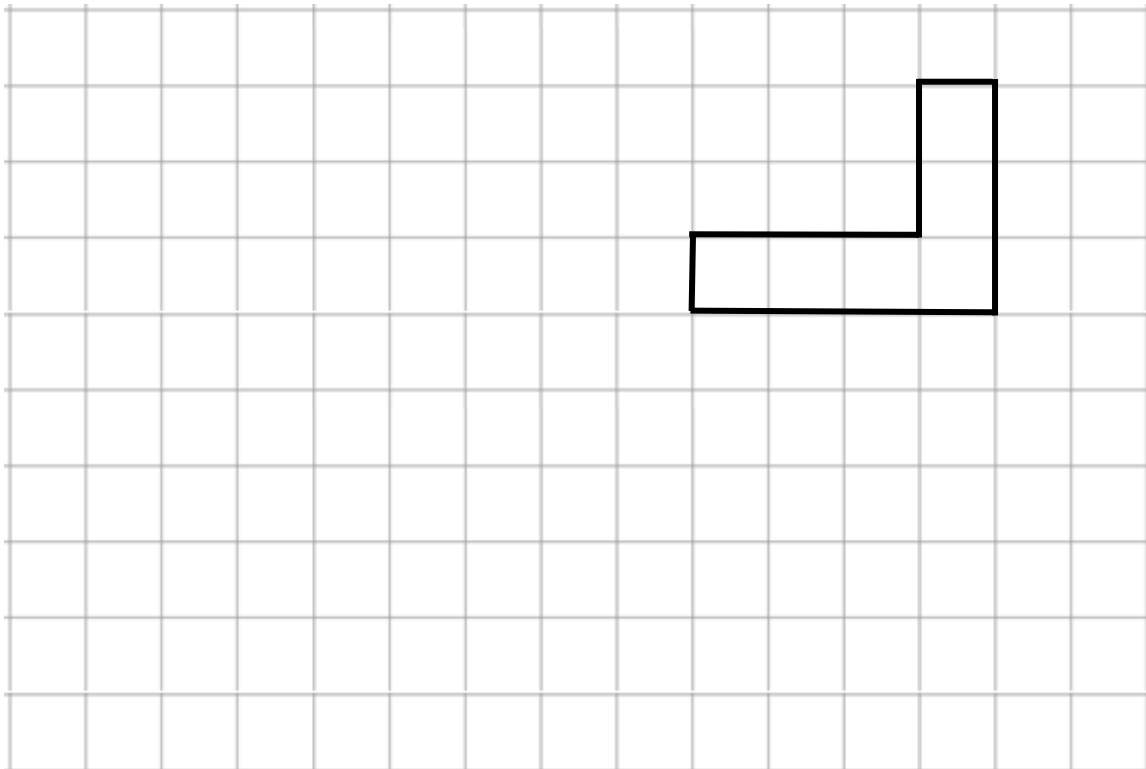
- 3 (c) Which **two** shapes fit together to make a rectangle?

[1 mark]

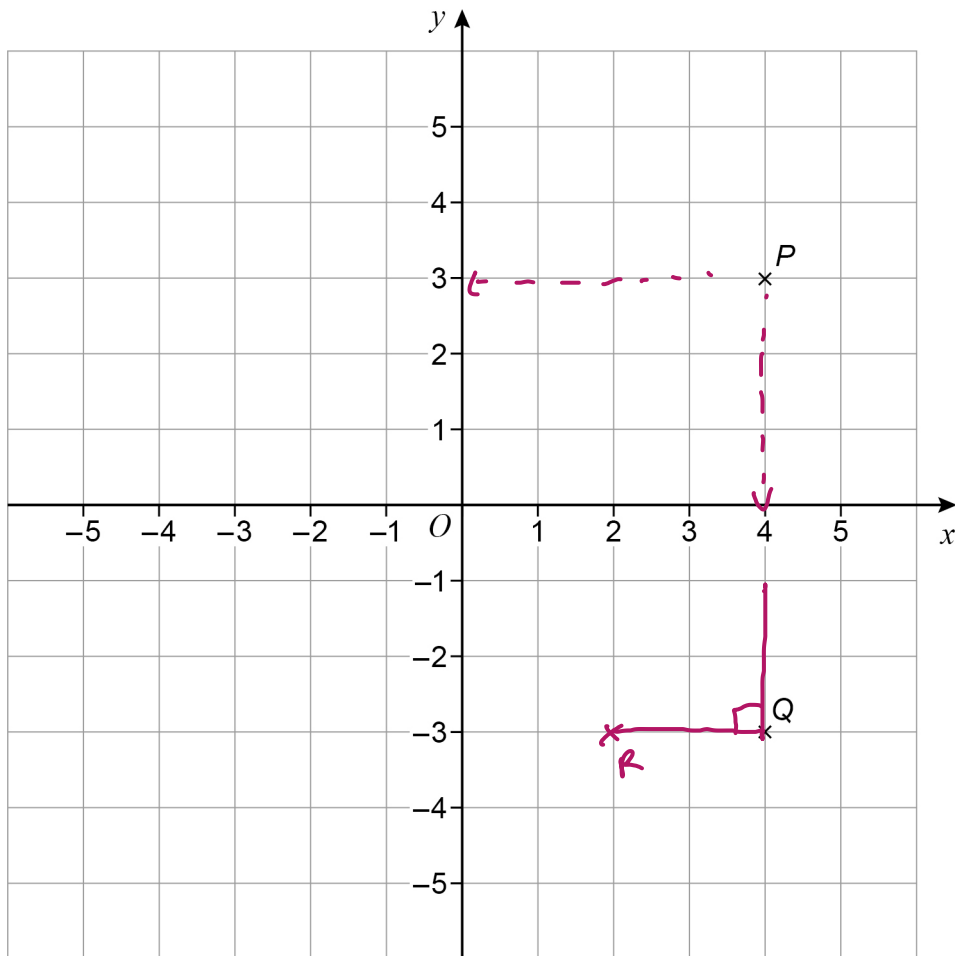
Answer _____ and _____

- 3 (d) On this grid draw a reflection of shape **F**.
Show your mirror line.

[2 marks]



- 4 Points P and Q are shown on the grid.



- 4 (a) Write down the coordinates of P .

(x , y)

[1 mark]

Answer (4 , 3)

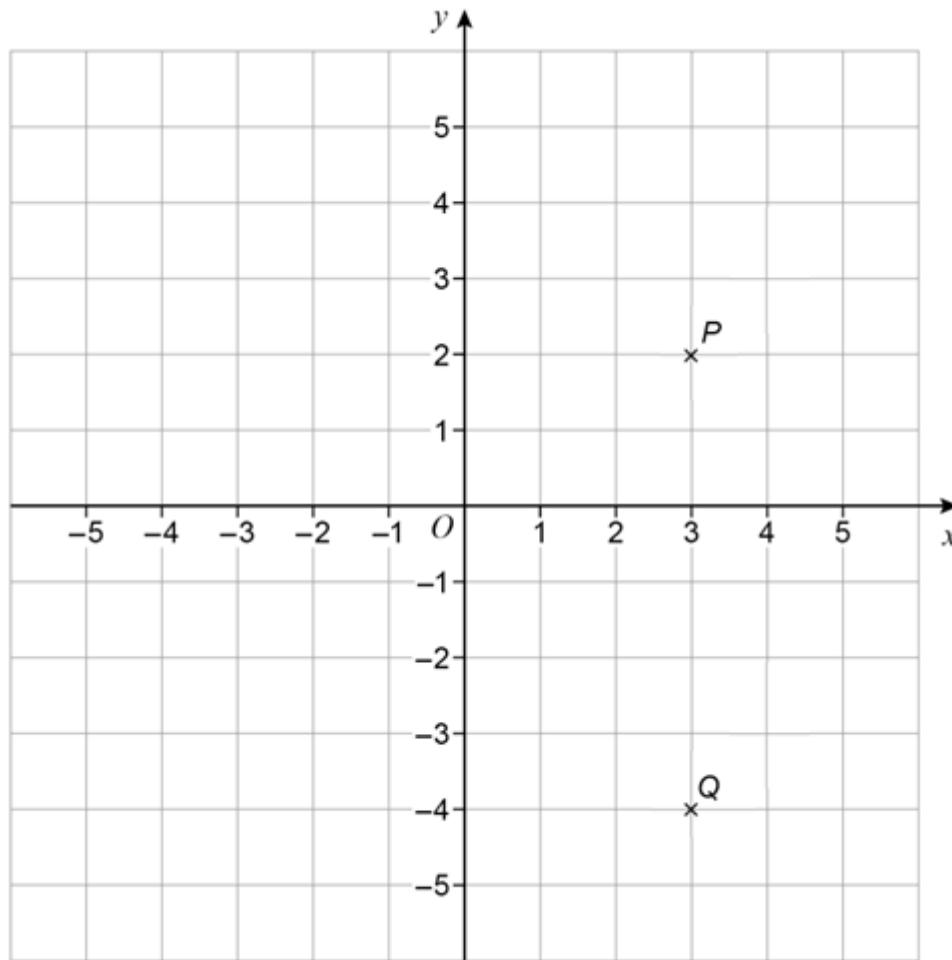
- 4 (b) Angle PQR is a right angle.

Work out possible coordinates for R .

[1 mark]

Answer (2 , -3)

- 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]

$$\begin{aligned} \text{£}5 &= 500\text{p} \\ 500\text{p} \div 75\text{p} &= 6.6 \end{aligned}$$

Answer 6

- 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]

① 10% of £2.50 = 25p
 $\text{£}2.50 - 25\text{p} = \text{£}2.25$

4 bottles	24 bottles
£2.25	£13.50

②

12 bottles	24 bottles
£7	£14

Answer Shop X

- 5 (a)** A shop sells bottles of cola.

Each bottle costs 65p

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

[2 marks]

Answer _____

- 5 (b)** Two shops sell bottles of lemonade.

Shop D

pack of 8 bottles

Was £5.50

Now 10% off

Shop F

pack of 20 bottles

£13

At which shop is it cheaper to buy 40 bottles?

Show working to support your answer.

[4 marks]

Answer _____

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]

2	+	4	+	19	+	21	=	46
even		even		odd		odd		

6 A game has four cards labelled W, X, Y and Z.

Holly picks two of the cards at random.

Complete the list of the **six** possible pairs of cards she could pick.

[2 marks]

WX

- 7 (a) Complete the boxes using
two **different** even numbers
and
two **different** odd numbers.

[2 marks]

$$\square + \square + \square + \square = 38$$

Turn over ►

- 7 (b) Complete the boxes using
a factor of 12
and
a factor of 40

[2 marks]

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

<u>12</u>	<u>40</u>
1 × 12	1 × 40
2 × 6	2 × 20
③ × 4	4 × ⑩

- 7 (c) Complete the boxes using
a square number
and
a prime number.

[2 marks]

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

Squares: 1, 4, 9, 16, 25, ③⑥ 36, 49, 64, 81, ...

Primes: ② 2, 3, 5, 7, 11, ...

- 7 (b) Complete the boxes using
a factor of 24
and
a factor of 50.

[2 marks]

$$\square \times \square = 40$$

- 7 (c) Complete the boxes using
a square number
and
a prime number.

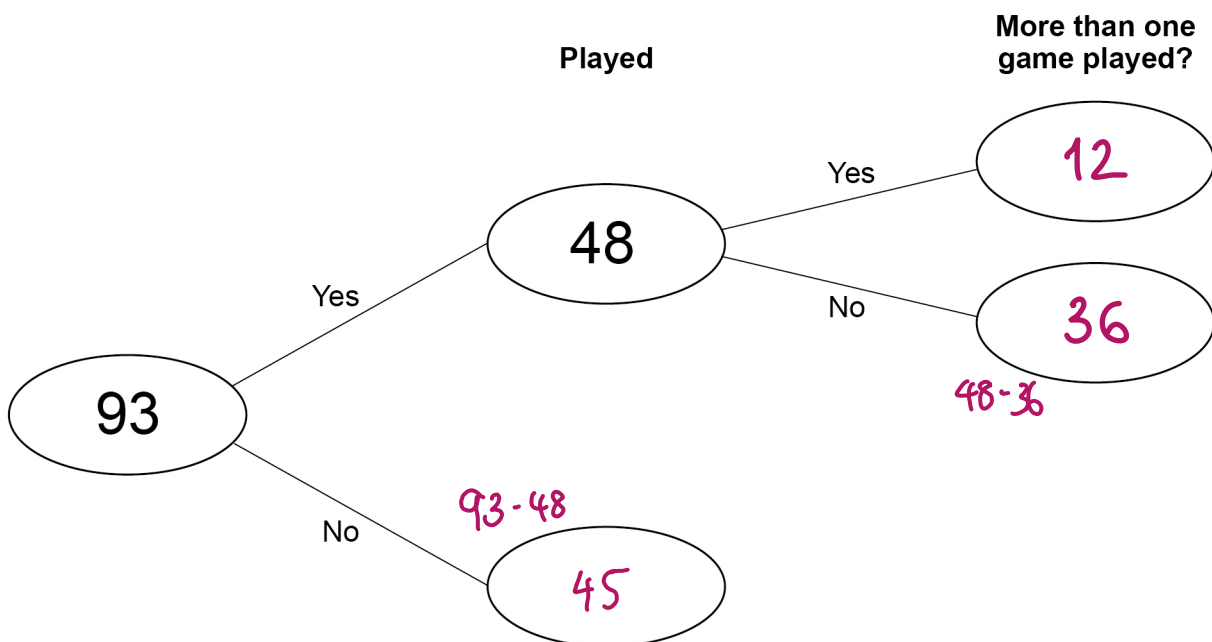
[2 marks]

$$\square \div \square = 32$$

8

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

The frequency tree shows some information about their answers.



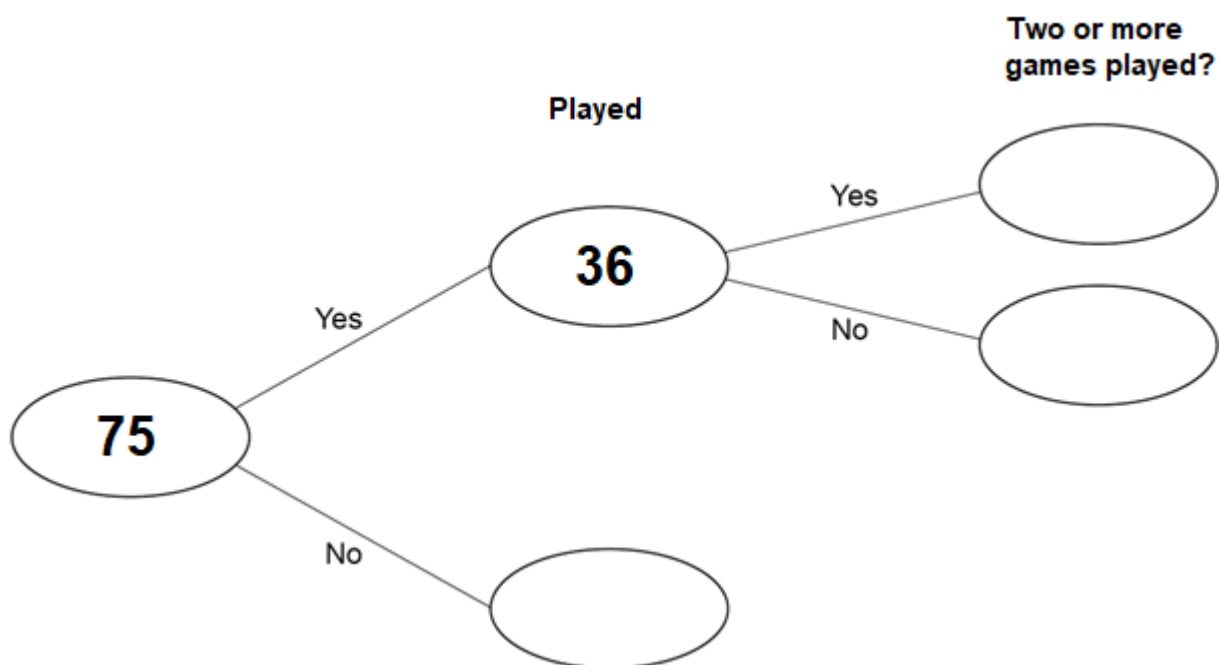
8 (a) 75% of the people who answered Yes played one game.

Complete the frequency tree.

[3 marks]

$$75\% = \frac{3}{4} \quad \frac{3}{4} \text{ of } 48 = (48 \div 4) \times 3 = 36$$

- 8 75 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(used social media) is **more than** 0.68

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

[2 marks]

$$0.68 \times 93 = 63.24$$

Answer 64

- 8 (b) One of the 75 people is chosen at random.

$P(\text{used social media})$ is **more than** 0.63

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

[2 marks]

Answer _____

- 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. $(12 - 4 = 8 \text{ months})$

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

[2 marks]

$$£6 \times 4 = £24$$

$$\begin{array}{r}
 £11 \times 8 = £88 \\
 24 \\
 88 \\
 \hline
 112
 \end{array}$$

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.

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

Give your answer in hours and minutes.

[3 marks]

$$1 \text{ h } 42 \text{ m} = 102 \text{ m}$$

$$9 \times 50 \text{ m} = 450 \text{ m}$$

$$450 + 102 = 552 \text{ minutes}$$

$$552 \div 60 = 9.2 \text{ hours}$$

$$9 \text{ hours} = 9 \times 60 = 540 \text{ minutes}$$

$$552 - 540 = 12$$

Answer 9 hours 12 minutes

- 9 (a)** The cost of a TV streaming service is
£9 per month for the first 2 months
then
£16 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 twelve episodes.
Eleven episodes are each 40 minutes long.
One episode is 1 hour 22 minutes long.

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

Give your answer in hours and minutes.

[3 marks]

Answer _____ hours _____ minutes

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

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

How many are blue?

[2 marks]

$$\frac{2}{5} \text{ of } 1020 = (1020 \div 5) \times 2 = 408$$

Answer 408

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

The ratio of green : red is 4 : 3

What fraction of the pens are green?

[1 mark]

G G G G R R R

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]

$$220 + 30 = 250 \quad \frac{220}{250} = 0.88 = 88\%$$

Answer 88 %

- 10 (a)** There are 1440 books in a library.

$\frac{2}{3}$ of the books are fiction.

How many are fiction?

[2 marks]

Answer _____

- 10 (b)** There are milk chocolates and dark chocolates in a box.

The ratio of milk : dark is 7 : 4

What fraction of the chocolates are milk?

[1 mark]

Answer _____

- 10 (c)** There are some pens in the box.

114 are black.

36 are not.

What percentage of the pens are black?

[2 marks]

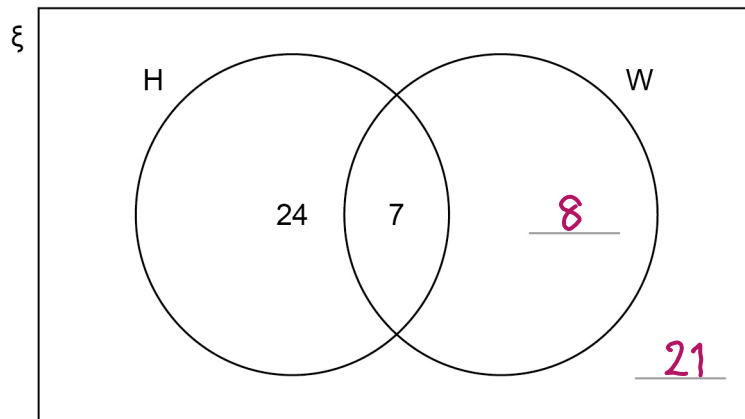
Answer _____ %

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]

$$15 - 7 = 8 \quad 60 - (24 + 7 + 8) = 60 - 39 = 21$$

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]

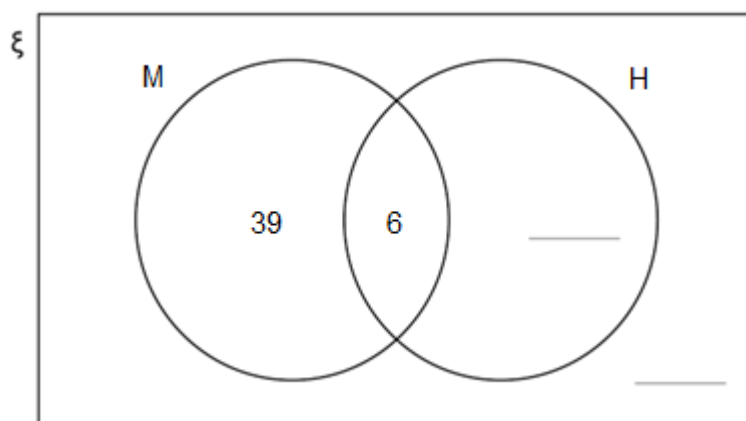
Answer $\frac{7}{60}$

11 Here is a Venn diagram.

$\xi = 60$ students

M = people who own a mobile phone

H = people who own headphones



11 (a) 11 of the people own headphones.

Complete the Venn diagram.

[2 marks]

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

What is the probability that they own **both** a mobile phone and headphones?

[1 mark]

Answer _____

- 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]

This calculation will complete division first.

Marek should work out $(35 - 19) \div 2$

- 11 (c)** Charlie is going to buy headphones that cost £45
He already has £17
He plans to save the rest in four equal amounts over the next four weeks.
He uses this method to work out in pounds how much to save each week.

$$45 - 17 \div 4$$

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]

Equivalent ratios are not written in the form $n:1$.

12

Sune says that $2 : 5$ is an equivalent ratio to $6 : 15$

Peter says that $1.2 : 3$ is an equivalent ratio to $6 : 15$

Who is correct?

Tick **one** box.

☐

Both of them

☐

Sune only

☐

Peter only

☐

Neither of them

Give reasons for your answer.

[2 marks]

[illegible]