

Please write clearly in block capitals.

Centre number

Candidate number

Surname \_\_\_\_\_

Forename(s) \_\_\_\_\_

Candidate signature \_\_\_\_\_

I declare this is my own work.

# GCSE MATHEMATICS

# F

Foundation Tier Paper 1 Non-Calculator

Thursday 16 May 2024

Morning

Time allowed: 1 hour 30 minutes

### Materials

For this paper you must have:

- mathematical instruments
- the Formulae Sheet (enclosed).



You must **not** use a calculator.

### 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.

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	
<b>TOTAL</b>	

### Advice

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



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

Do not write  
outside the  
box

1 (a) Work out  $280 \div 7$

[1 mark]

$$\begin{array}{r} 040 \\ 7 \overline{)280} \end{array}$$

Answer 40

1 (b) Work out  $1062 - 438$

[2 marks]

$$\begin{array}{r} 51 \\ 10\cancel{6}2 \\ - 438 \\ \hline 624 \end{array}$$

Answer 624



2 (a) Complete the statement.

$$m \xrightarrow{\times 100} cm$$

[1 mark]

2 metres = 200 centimetres

2 (b) Complete the statement.

$$kg \xrightarrow{\times 1000} g$$

[1 mark]

8 kilograms = 8000 grams

2 (c) Convert 24 kilometres to miles.

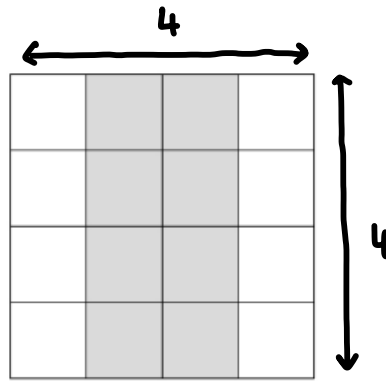
Use 8 kilometres = 5 miles

[2 marks]

$$\begin{array}{l} \times 3 \quad 8 \text{ km} = 5 \text{ miles} \\ \times 3 \quad 24 \text{ km} = 15 \text{ miles} \end{array}$$

Answer 15 miles

- 3 (a) Here is a centimetre grid.



$$4 \times 4 = 16$$

$$8 \text{ shaded}$$

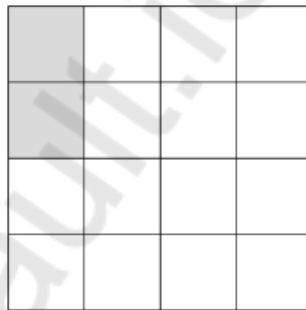
$$\frac{8}{16} = \frac{1}{2} = 50\%$$

What **percentage** of the grid is shaded?

[1 mark]

Answer 50 %

- 3 (b) Kai has shaded two small squares on this centimetre grid.



$$\frac{3}{4} \text{ of } 16$$

$$16 \div 4 = 4$$

$$4 \times 3 = 12$$

$$12 - 2 = 10$$

He wants  $\frac{3}{4}$  of the grid to be shaded.

How many **more** small squares must he shade?

[2 marks]

Answer 10



- 4 (a) Here is a list of four numbers.

6.92      7.27      7.18      7.14

Use **one** number from the list to complete each statement.

[2 marks]

The number closest in value to 7 is 6.92

The number that rounds to 7.2 to 1 decimal place is 7.18

- 4 (b) Here is a list of six numbers.

-10      -5      -2      4      6      10

Use **two** numbers from the list to complete each statement.

[2 marks]

$$-5 + 4 = -1$$

Two numbers that **add** to make -1 are -5 and 4

Two numbers that **multiply** to make 20 are -10 and -2

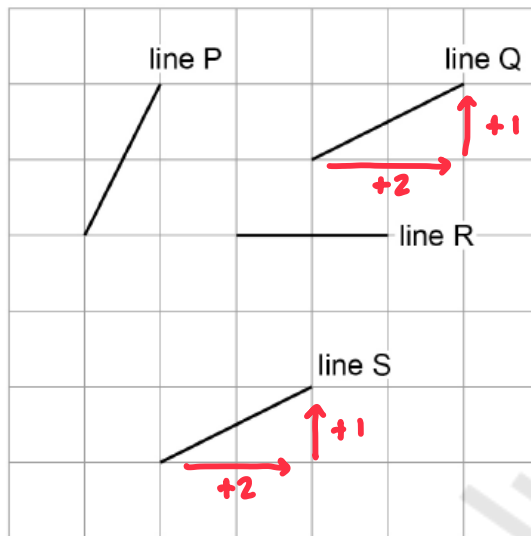
$$-10 \times -2 = 20$$

Turn over for the next question

Turn over ►



- 5 (a) Here are four lines on a square grid.

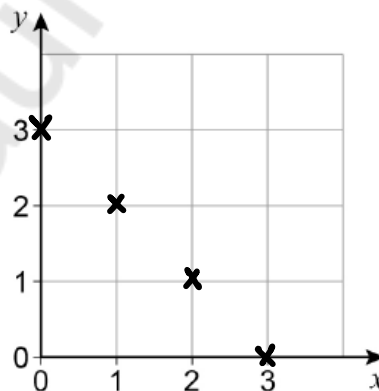


Which **two** lines are parallel?

[1 mark]

line Q and line S

- 5 (b) Here is a different grid.



There are **four** points on this grid that each have  
both coordinates that are whole numbers  
and

$$x\text{-coordinate} + y\text{-coordinate} = 3$$

$$0 + 3 = 3 \quad (0, 3)$$

$$1 + 2 = 3 \quad (1, 2)$$

$$2 + 1 = 3 \quad (2, 1)$$

$$3 + 0 = 3 \quad (3, 0)$$

Plot the **four** points on the grid.

[2 marks]



6 (a) Write down the value of  $3^2$ 

$$3 \times 3 = 9$$

[1 mark]

Answer 96 (b) Write down the value of  $\sqrt{144}$ 

$$12 \times 12 = 144$$

[1 mark]

Answer 126 (c) Work out the value of  $2^4$ 

[1 mark]

$$\begin{array}{ccccccc} 2 & \times & 2 & \times & 2 & \times & 2 \\ 4 & & & \times & & & 4 \end{array}$$

Answer 16

Turn over for the next question

Turn over ►



- 7 (a) At a restaurant, vegan pizzas have two **different** toppings.

The toppings are

sweetcorn (S)      mushrooms (M)      peppers (P)

Complete the table to list all the possible pairs of toppings.

[1 mark]

SM
SP
mp

- 7 (b) At the restaurant, dough balls can be ordered in small portions and large portions.

**Small portion**

6 dough balls

**Large portion**

10 dough balls

A group of people want to order **exactly** 44 dough balls.

Show how they can do this.

[2 marks]

$$6 \times 4 = 24 \rightarrow 4 \text{ small}$$

$$44 - 24 = 20$$

$$2 \times 10 = 20 \rightarrow 2 \text{ large}$$

Number of Small portions     4    

Number of Large portions     2    



8

Apples	25p each
Oranges	60p each

Salma has £10 to buy apples and oranges.

She buys

9 apples

and

as many oranges as possible.

How many oranges does she buy?

[4 marks]

$$9 \text{ apples} \quad \begin{array}{r} 25 \\ \times 9 \\ \hline 225 \end{array} \quad 225p$$

$$£10 \xrightarrow{\times 100} 1000p$$

$$\begin{array}{r} 99 \\ \times 60 \\ \hline \end{array}$$

$$\begin{array}{r} 99 \\ \times 60 \\ \hline - 225 \\ \hline 775p \text{ left} \end{array}$$

$$775 \div 60 \approx 12.9$$

$$60 \overline{) 012.9} \\ \underline{77} \quad 55 \quad 50 \quad 00$$

$$\approx 12 \text{ oranges}$$

Answer 12

Turn over ►



- 9 Alina and Sue play netball.  
The number of goals they scored in 8 games is shown.

<b>Alina</b>	12	15	17	17	21	22	24	26
<b>Sue</b>	<del>13</del>	<del>13</del>	<del>17</del>	20	22	<del>23</del>	<del>24</del>	<del>31</del>

- 9 (a) Complete this table.

[2 marks]

	Range	Median
<b>Alina</b>	14	19
<b>Sue</b>	18	21

largest - smallest  
26 - 12

middle values

- 9 (b) Which player scored the more consistent number of goals?

Tick a box.

Alina

Sue

Give a reason for your answer.

[1 mark]

Alina's range is lower than Sue's.



10 Work out 35% of 1200 [3 marks]

$$\begin{array}{l}
 100\% = 1200 \\
 \div 10 \quad 10\% = 120 \quad \xrightarrow{\div 10 \quad \times 3} \quad 30\% = 360 \\
 \div 2 \quad 5\% = 60
 \end{array}$$

$$\begin{array}{r}
 360 \\
 + 60 \\
 \hline
 420
 \end{array}$$

Answer 420

Turn over for the next question

Turn over ►



- 11 A window cleaner uses this formula.

$$C = 2W + 5$$

$C$  = cost, in £, for the customer

$W$  = number of windows to be cleaned

- 11 (a) How much does it cost for 6 windows to be cleaned?

[2 marks]

$$W = 6$$

$$C = 2(6) + 5$$

$$= 12 + 5$$

Answer £ 17

- 11 (b) The cost for another customer was £24

Show why this cost **must** be incorrect.

[1 mark]

$$C = 24$$

$$\begin{array}{r} 24 = 2W + 5 \\ - 5 \quad - 5 \end{array}$$

$$\begin{array}{r} 09.5 \\ 2 \overline{)19.0} \end{array}$$

$$\begin{array}{r} 19 = 2W \\ \div 2 \quad \div 2 \end{array}$$

$$9.5 = W$$

Cannot have half a window.



12 Two bags, X and Y, each contain coloured discs.

In bag X,  $\frac{7}{20}$  of the discs are red.

In bag Y,  $\frac{2}{5}$  of the discs are red.

Which bag has the **greater** proportion of red discs, X or Y?

You **must** show your working.

[2 marks]

$$\text{Bag X} = \frac{7}{20}$$

$$\text{Bag Y} = \frac{2}{5} \times 4 = \frac{8}{20}$$

$$8 > 7$$

Answer Y

Turn over for the next question

Turn over ►



- 13 (a) Two friends share £240 in the ratio 1 : 3

Work out the larger share.

[2 marks]

$$1 + 3 = 4 \text{ parts total}$$

$$£240 \div 4 = £60 \text{ per part}$$

$$£60 \times 3 = £180$$

Answer £ 180

- 13 (b) A tennis player wins or loses matches in the ratio win : lose = 5 : 9

What fraction of the matches do they win?

[1 mark]

$$5 + 9 = 14 \text{ parts total}$$

Answer  $\frac{5}{14}$



14 Here is a multiplication table.

×	61	63	65	67
61	3721	3843	3965	4087
63	3843	3969	4095	4221
65	3965	4095	4225	4355
67	4087	4221	4355	4489

Use the table to answer the following questions.

14 (a) Work out  $3843 \div 63$        $3843 = 61 \times 63$       [1 mark]

Answer 61

14 (b) Work out  $6.1 \times 6.7$        $61 \times 67 = 4087$   
 $\div 10 \quad \div 10 \quad \div 100$   
 $6.1 \times 6.7 = 40.87$       [1 mark]

Answer 40.87

14 (c) Work out  $63 \times 66$       [2 marks]

$$63 \times 65 = 4095$$

$$63 \times \downarrow +1 = 63$$

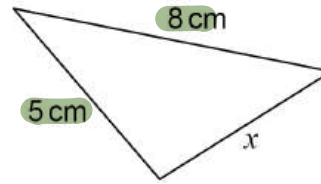
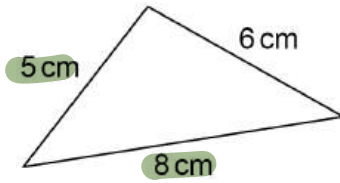
$$63 \times 66 = 4158$$

Answer 4158



15 These two triangles are **congruent**.

Not drawn  
accurately



Write down the value of  $x$ .

[1 mark]

$$x = \underline{\quad 6 \quad} \text{ cm}$$

16  $c$  and  $d$  are positive numbers.

$c$  is even.

$d$  is odd.

Tick a box for each expression.

[3 marks]

	Even	Odd	Cannot tell
$c + d$ e.g. $2 + 7 = 9$	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
$4c$ e.g. $4 \times 2 = 8$	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
$\frac{c}{2}$ e.g. $\frac{2}{2} = 1$	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
$\frac{8}{2} = 4$	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



17 A linear sequence has

- 1st term = 10
- 1st term + 2nd term = 39

Work out the 5th term.

[4 marks]

10

$$\text{2nd term} = 39 - 10 = 29$$

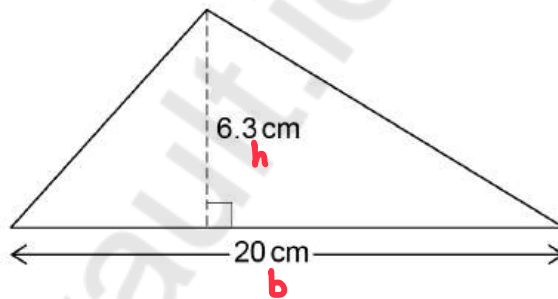
10, 29, 48, 67, 86

+19 +19 +19 +19

Answer 86

18

Not drawn  
accurately



Work out the area of this triangle.

[2 marks]

$$\begin{aligned} A &= \frac{1}{2} \times b \times h \\ &= \frac{1}{2} \times 20 \times 6.3 \\ &= 10 \times 6.3 \\ &= 63 \end{aligned}$$

Answer 63 cm<sup>2</sup>



- 19 The vector  $\begin{pmatrix} -3 \\ 7 \end{pmatrix}$  translates A to B. **3 left**  
**7 up**

Write down the vector that translates B to A.

[1 mark]

**3 right**

**7 down**

Answer

$$\begin{pmatrix} 3 \\ -7 \end{pmatrix}$$

- 20 The attendance for a rugby match is 8400 people to the nearest 100

- 20 (a) Write down the minimum possible attendance.  **$100 \div 2 = 50$**   
 **$8400 - 50$**

[1 mark]

Answer                     **8350**                    

- 20 (b) Write down the maximum possible attendance.

[1 mark]

Answer                     **8449**                    

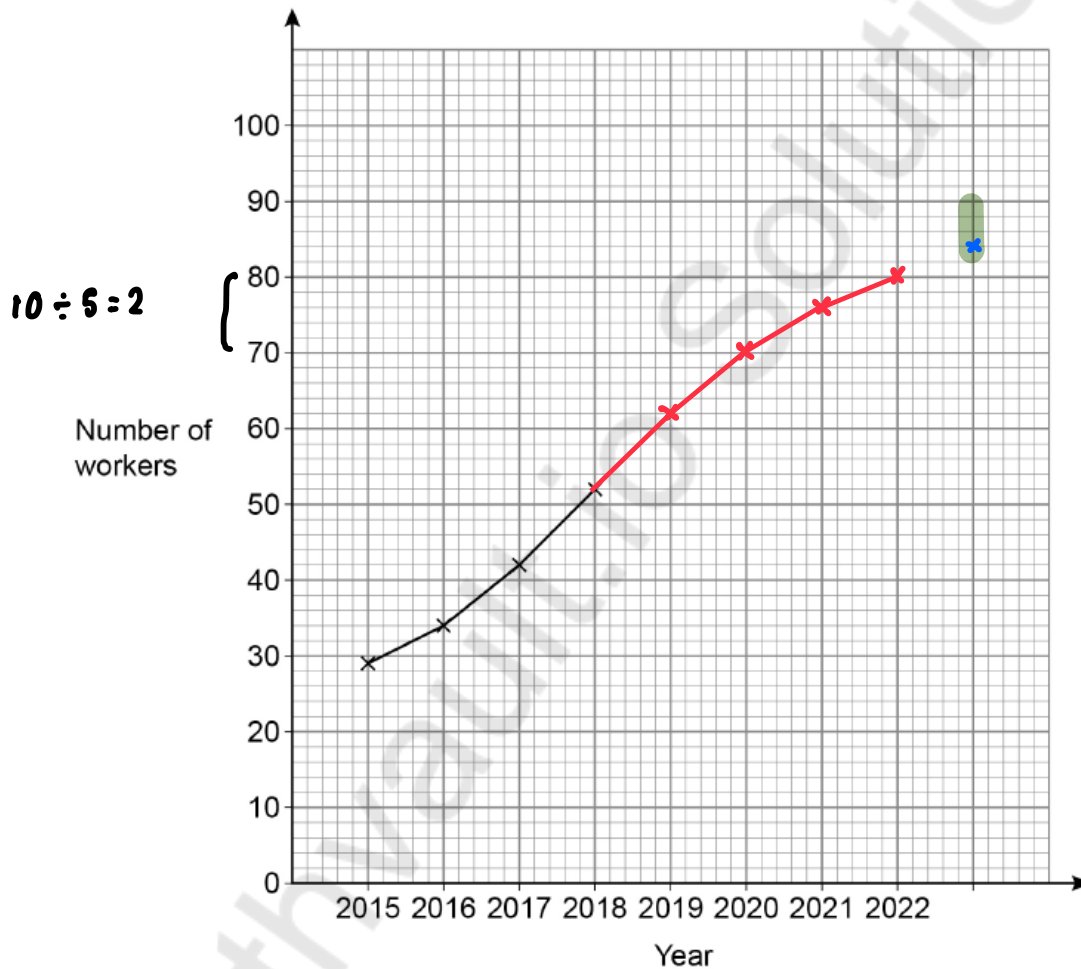


- 21 The table shows the number of workers at a company in different years.

Year	2015	2016	2017	2018	2019	2020	2021	2022
Number of workers	29	34	42	52	62	70	76	80

A time-series graph is drawn to represent the data.

The first four points have been plotted.



- 21 (a) Complete the graph.

[2 marks]

- 21 (b) Estimate the number of workers at the company in 2023.

[1 mark]

Answer 84

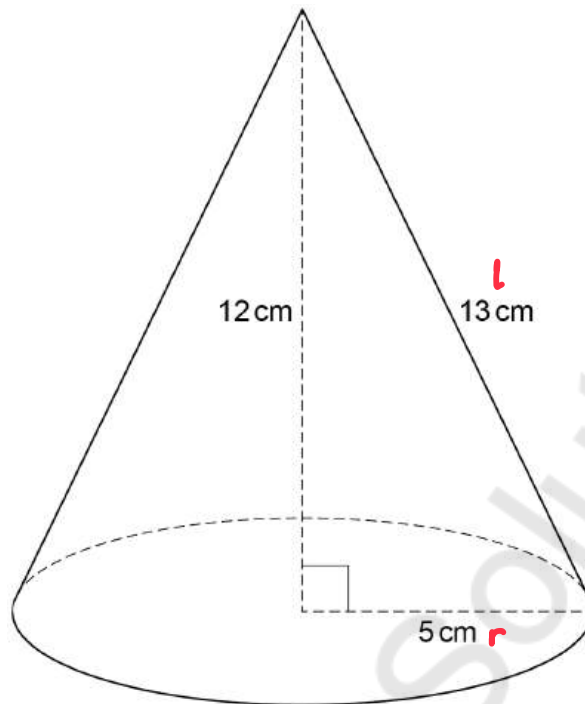
82 → 90

Turn over ►



22

Here is a cone.



22 (a)

Curved surface area of a cone =  $\pi r l$   
 where  $r$  is the radius and  $l$  is the slant height

Beth tries to work out the curved surface area in terms of  $\pi$

$$\begin{aligned} \text{Curved surface area of the cone} &= \pi \times 5 \times 12 \\ &= 60\pi \text{ cm}^2 \end{aligned}$$

What mistake has she made?

[1 mark]

She used the perpendicular height instead of  
 the slant height.



22 (b) Adam uses  $\pi = 3$  to estimate the area of the **base** of the cone.

Work out his estimate.

[2 marks]

$$\begin{aligned} & \pi r^2 \quad r = 5 \\ & 3(5)^2 \\ & 3(25) \\ & = 75 \end{aligned}$$

Answer 75 cm<sup>2</sup>

22 (c) Beth uses  $\pi = 3.14$  to estimate the area of the **base** of the cone.

Is Beth's estimate more than or less than Adam's estimate?

Tick a box.

More than  Less than

Give a reason for your answer.

[1 mark]

3.14 is greater than 3.

Turn over for the next question



23

Each day, Erik drinks

 $\frac{1}{4}$  of a pint of milk in the morning

and

 $\frac{1}{2}$  of a pint of milk in the afternoon.

How many pints of milk does he drink in 30 days?

$$\frac{1}{4} + \frac{1}{2} \quad \begin{array}{l} \times 2 \\ \times 2 \end{array}$$

[3 marks]

$$\frac{1}{4} + \frac{2}{4} = \frac{3}{4} \text{ of a pint each day}$$

$$\frac{3}{4} \times 30 = \frac{90}{4} \text{ in 30 days}$$

$$= 22 \frac{2}{4}$$

$$= 22 \frac{1}{2} \text{ pints}$$

Answer  $22 \frac{1}{2}$



24 Solve  $7x - 22 = 4x + 29$  [3 marks]

$$-4x \quad -4x$$

$$3x - 22 = 29$$

$$+22 \quad +22$$

$$3x = 51$$

$$\div 3 \quad \div 3$$

$$x = 17$$

$$x = 17$$

25 In a house

the floor area of the living room is  $26 \text{ m}^2$

the floor area of the kitchen is  $16.4 \text{ m}^2$

Express the area of the living room as a fraction of the area of the kitchen.

Give your answer in its simplest form.

[3 marks]

$$\frac{26}{16.4} \begin{matrix} \times 10 \\ \times 10 \end{matrix} = \frac{260}{164} \begin{matrix} \div 2 \\ \div 2 \end{matrix} = \frac{130}{82} \begin{matrix} \div 2 \\ \div 2 \end{matrix} = \frac{65}{41}$$

Answer  $\frac{65}{41}$

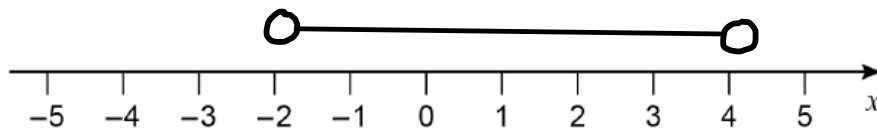




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outside the  
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26 (a) Represent  $-2 < x < 4$  on the number line.

[1 mark]



26 (b) Solve  $5y + 14 \geq 11$

[2 marks]

$$- 14 \quad - 14$$

$$5y \geq -3$$

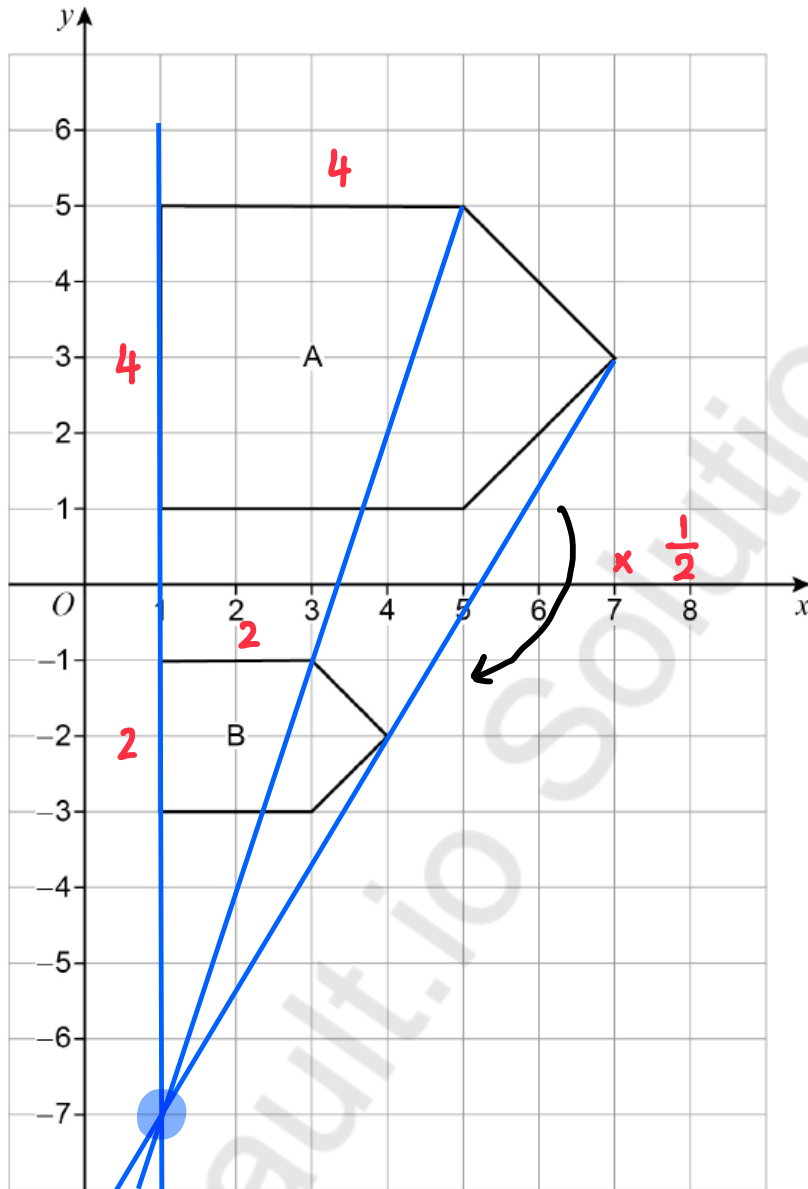
$$\div 5 \qquad \div 5$$

$$y \geq \frac{-3}{5}$$

Answer  $y \geq \frac{-3}{5}$



27



Describe fully the **single** transformation that maps shape A to shape B.

[3 marks]

Enlargement

Scale factor =  $\frac{1}{2}$

Centre  $(1, -7)$

END OF QUESTIONS

6



**There are no questions printed on this page**

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**DO NOT WRITE ON THIS PAGE  
ANSWER IN THE SPACES PROVIDED**

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