Please check the examination details below before entering your candidate information

Candidate surname	Other names

Centre Number | Candidate Number

Pearson Edexcel International GCSE

Monday 10 November 2025

Morning (Time: 2 hours 30 minutes)

Paper reference **4MB1/02**

Mathematics B
PAPER 2

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.*
- **Calculators may be used.**

Information

- The total mark for this paper is 100.
- 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.
- Check your answers if you have time at the end.
- Without sufficient working, correct answers may be awarded no marks.

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P 7 9 5 5 8 A 0 1 4 0

Pearson

Answer ALL TWELVE questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

1 (a) Write 2.51×10^4 as an ordinary number.

(1)

(b) Write 0.000 006 37 in standard form.

(1)

(c) Calculate $\left(5\times10^{100}\right)\times\left(7\times10^{99}\right)$

Give your answer in standard form.

(2)

(d) Calculate $\left(5\times10^{100}\right)-\left(7\times10^{99}\right)$

Give your answer in standard form.

(2)

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Question 1 continued

(Total for Question 1 is 6 marks)

2

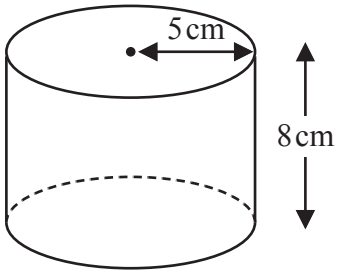


Diagram **NOT** accurately drawn

Figure 1

Figure 1 shows a right circular solid cylinder with radius 5 cm and height 8 cm

(a) Calculate, in cm^2 to 3 significant figures, the total surface area of the cylinder.

(3)

A and **B** are two mathematically similar solids.

The surface area of **A** is 3051 cm^2

The surface area of **B** is 5424 cm^2

Given that

volume of **A** + volume of **B** = 2548 cm^3

(b) calculate the volume, in cm^3, of **B**

(4)

Question 2 continued

(Total for Question 2 is 7 marks)

3 (a) Solve the inequality $3p - 2 > 4$

(2)

(b) Solve the inequality $5(2 - q) < 30$

(2)

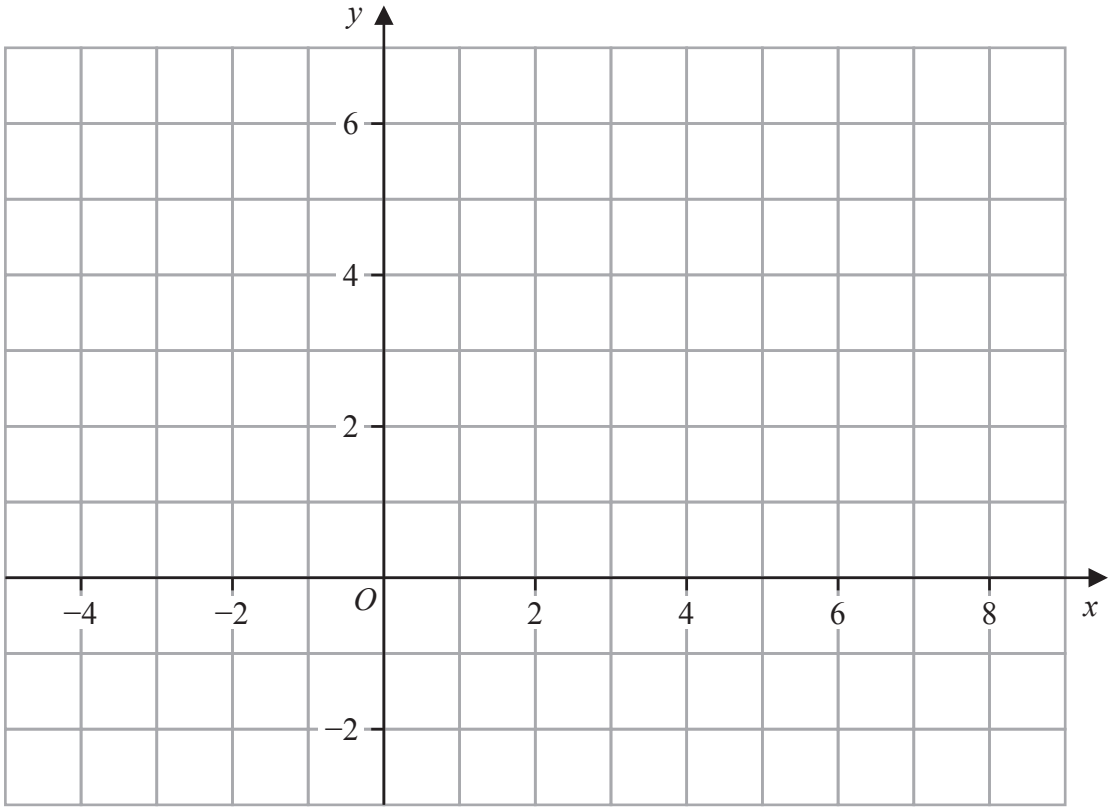
(c) On the grid opposite, by drawing suitable straight lines and using shading, show the region **R** that satisfies the inequalities

$$y > 1 \qquad x + y < 5 \qquad y < 2x + 3$$

Label the region **R**

(4)

Question 3 continued



(Total for Question 3 is 8 marks)

4

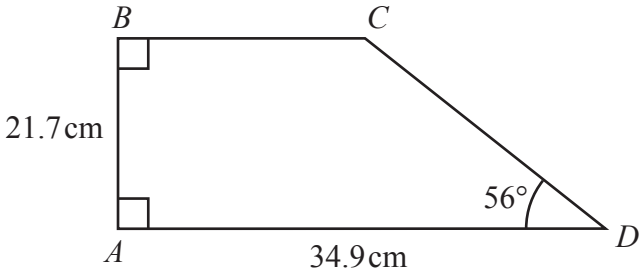


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Figure 2

Figure 2 shows trapezium $ABCD$

$AB = 21.7\,\text{cm}$ $AD = 34.9\,\text{cm}$ $\angle ADC = 56°$ $\angle ABC = \angle BAD = 90°$

(a) Calculate the perimeter, in cm to 3 significant figures, of trapezium $ABCD$

(4)

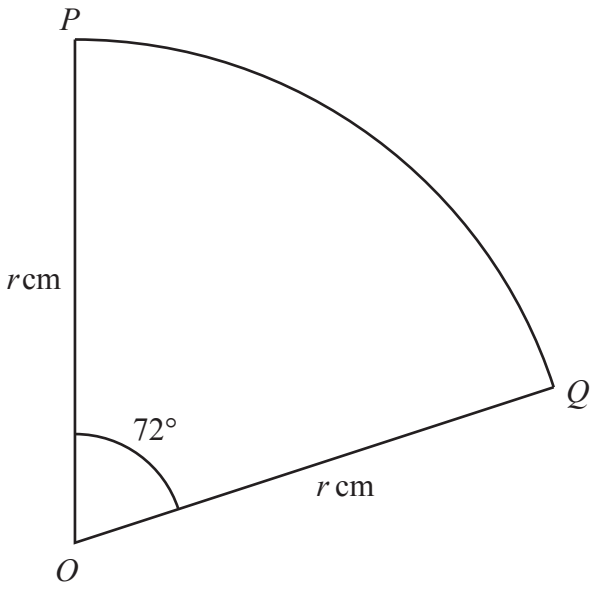

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Figure 3

Figure 3 shows sector POQ of a circle with centre O and radius r cm

$\angle POQ = 72°$

Given that the perimeter of trapezium $ABCD$ is equal to the perimeter of sector POQ

(b) calculate the area, in cm^2 to 3 significant figures, of sector POQ

(5)

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Question 4 continued

Question 4 continued

Question 4 continued

(Total for Question 4 is 9 marks)

5 Solve the simultaneous equations

$$4x^2 - y^2 = 27$$

$$x + 2y = 3$$

Show clear algebraic working.

(6)

$$\left[\text{Solutions of } ax^2 + bx + c = 0 \text{ are } x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}\right]$$

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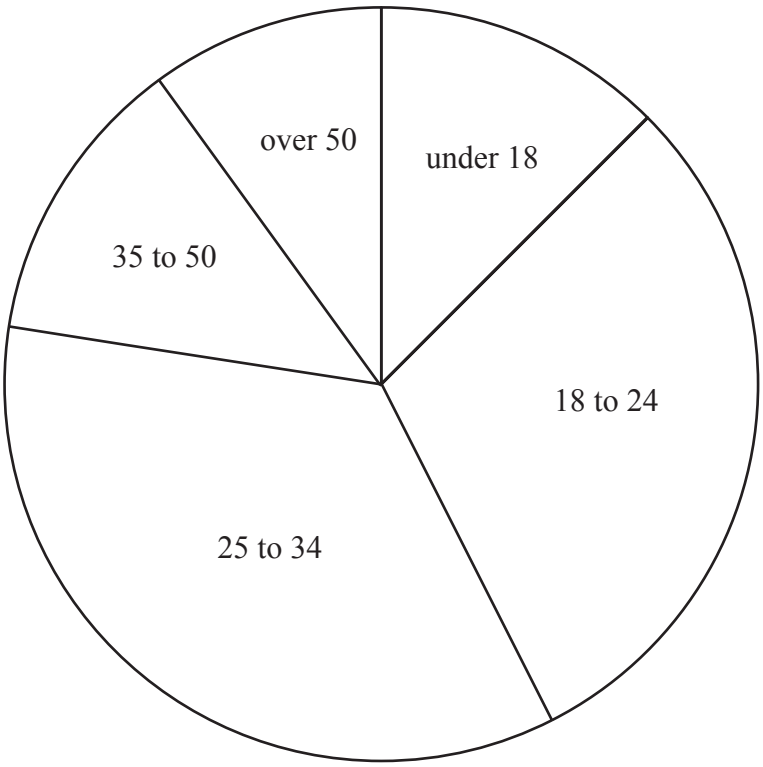
Question 5 continued

(Total for Question 5 is 6 marks)

6 The accurate pie chart below shows information about the ages, in years, of 120 runners.



(a) Calculate how many of these 120 runners are aged 25 to 34

(3)

Xavier is one of the runners.
He runs

3000 metres to the nearest 100 metres
in
18 minutes to the nearest minute

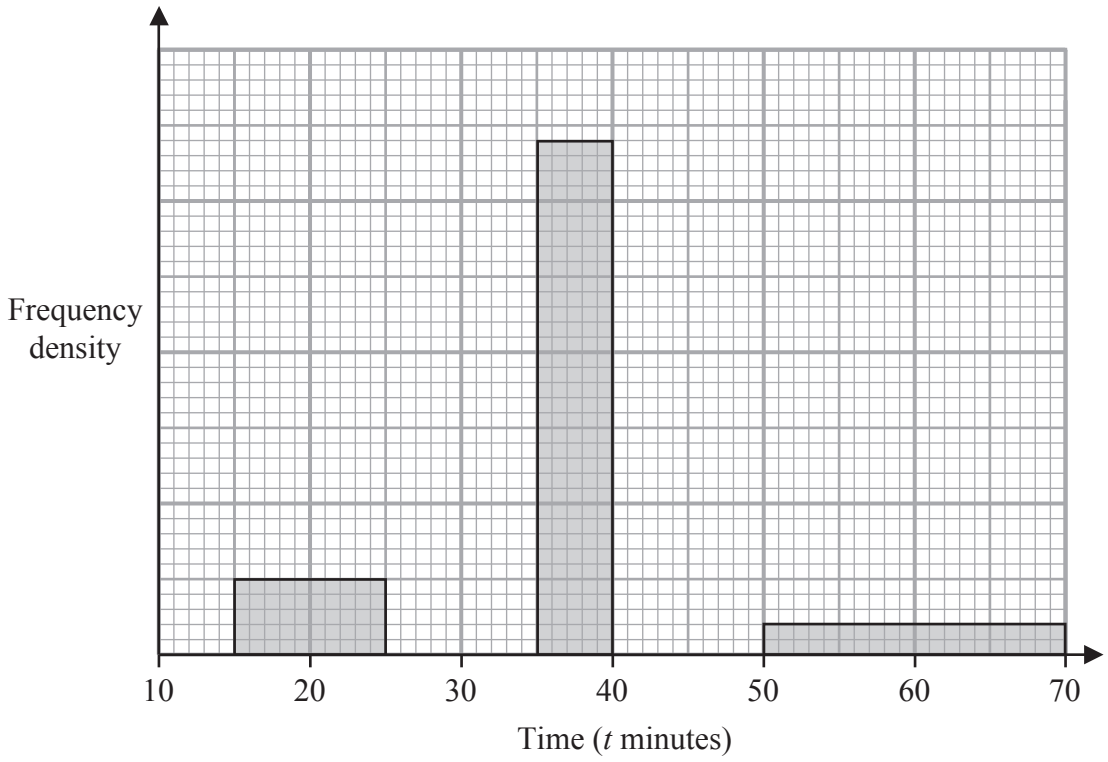
(b) Calculate the lower bound, in metres/minute to 3 significant figures, for Xavier's average speed.
Show all your working.

(4)

Question 6 continued

The times, in minutes, for the 120 runners to complete 5 km is recorded.
No runner takes less than 15 minutes or more than 70 minutes.
The incomplete table and the incomplete histogram give information about the times.

Minutes (t minutes)	Frequency
$15 < t \leqslant 25$	10
$25 < t \leqslant 30$	16
$30 < t \leqslant 35$	28
$35 < t \leqslant 40$	
$40 < t \leqslant 50$	24
$50 < t \leqslant 70$	



(c) Complete the table and the histogram.

(3)

Question 6 continued

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Question 6 continued

(Total for Question 6 is 10 marks)

7 Alex produces and sells cans of drink.

The table shows the production costs for 80 000 cans of drink.

	Production cost (euros)
Manufacturing	31 000
Other	4 350
Total production cost	35 350

(a) Calculate the manufacturing cost as a percentage of the total production cost.
Give your answer to one decimal place.

(2)

Alex sells each of the 80 000 cans of drink for £0.60

Using the exchange rate of £1 = 1.15 euros,

(b) calculate the percentage profit that Alex makes.
Give your answer to 3 significant figures.

(4)

Alex borrows £20 000 on 1st January 2026 from a bank.
On 31st December each year, starting on 31st December 2026, the bank charges interest of 8.4% on the amount of money that Alex owes the bank.
This interest is added to the amount of money that he owes the bank.

Given that Alex does not repay any of the money that he owes the bank,

(c) calculate how much money Alex owes the bank on 1st January 2028
Give your answer to 2 decimal places.

(2)

Alex also sells snacks.
The selling price for each snack, after tax is added, is £0.90

Given that the rate of tax is 20%

(d) calculate the selling price for each snack, in £, before tax is added.

(2)

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Question 7 continued

Question 7 continued

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Question 7 continued

(Total for Question 7 is 10 marks)

8 Triangle A and triangle E are drawn on the grid opposite.

(a) Describe fully the single transformation that maps triangle A onto triangle E

(3)

Triangle A is transformed to triangle B under the translation $\begin{pmatrix} 6 \\ -2 \end{pmatrix}$

(b) On the grid, draw and label triangle B

(2)

Triangle A is transformed to triangle C under an enlargement with scale factor 3 and centre of enlargement (5, 7)

(c) On the grid, draw and label triangle C

(2)

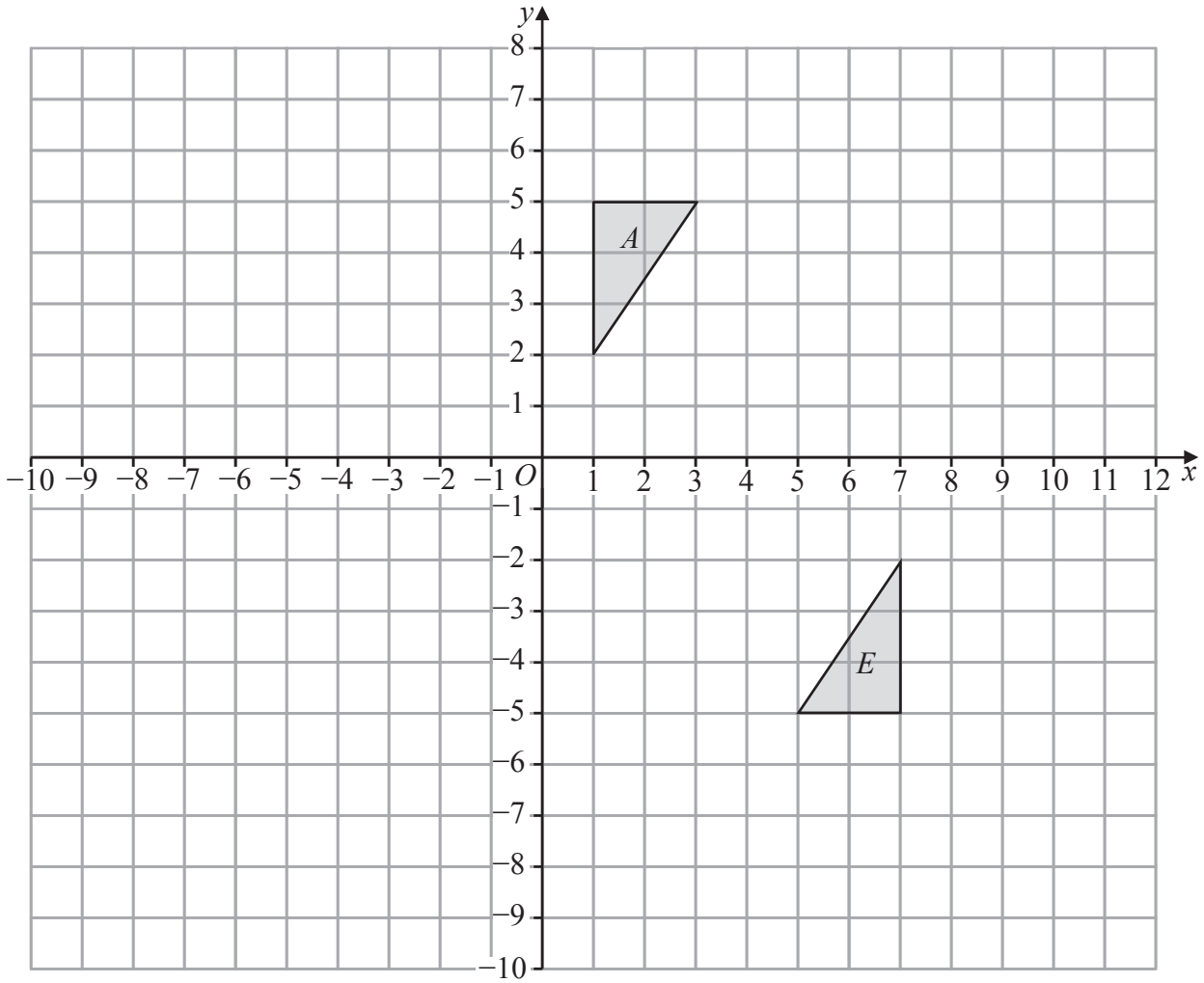
Triangle A is transformed to triangle D under the transformation with matrix $\mathbf{M}$ where

$$\mathbf{M} = \begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$$

(d) On the grid, draw and label triangle D

(3)

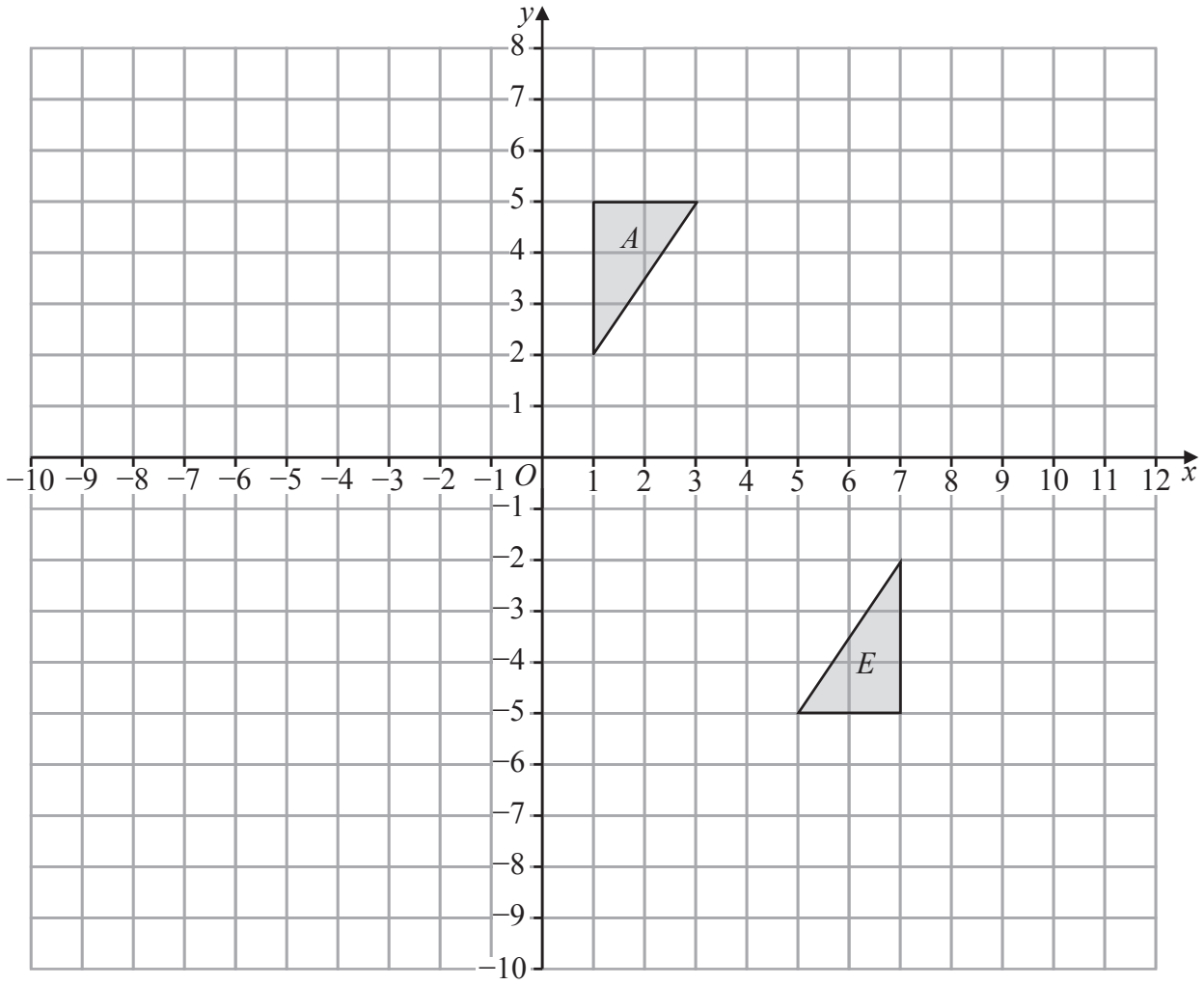
Question 8 continued



Turn over for a spare grid if you need to redraw your triangles.

Question 8 continued

Only use this grid if you need to redraw your triangles.



(Total for Question 8 is 10 marks)

9 (a) Complete the table of values for $y = 2x^3 - 9x^2 + 3x + 7$

x	–1	0	0.25	1	2	3	4
y		7	7.22			–11	

(2)

(b) On the grid opposite, plot the points from your completed table and join them to form a smooth curve.

(3)

(c) By drawing a suitable straight line (at least 3 cm long) on the grid, find an estimate for the gradient of the curve at the point where $x = 0.5$

(2)

(d) Use your graph, to estimate, to one decimal place, the solutions of the equation

$$2x^3 - 9x^2 + 3x + 7 = 0$$

(1)

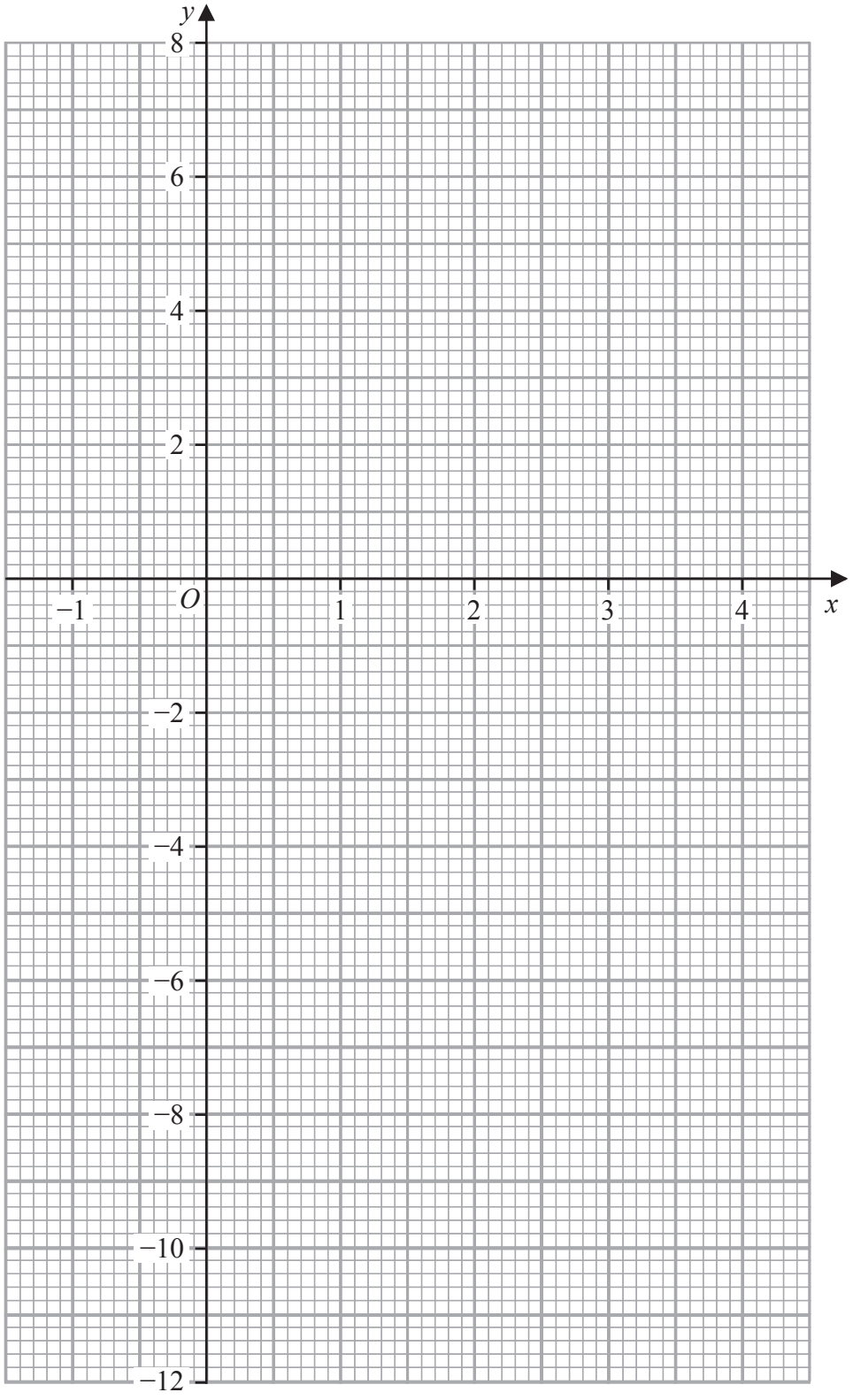
(e) By drawing a suitable straight line on the grid, find an estimate for the range of values of x, to one decimal place, in the interval $0 < x \leqslant 4$ for which

$$4x - 18 + \frac{38}{x^2} < 0$$

Show clear algebraic working.

(4)

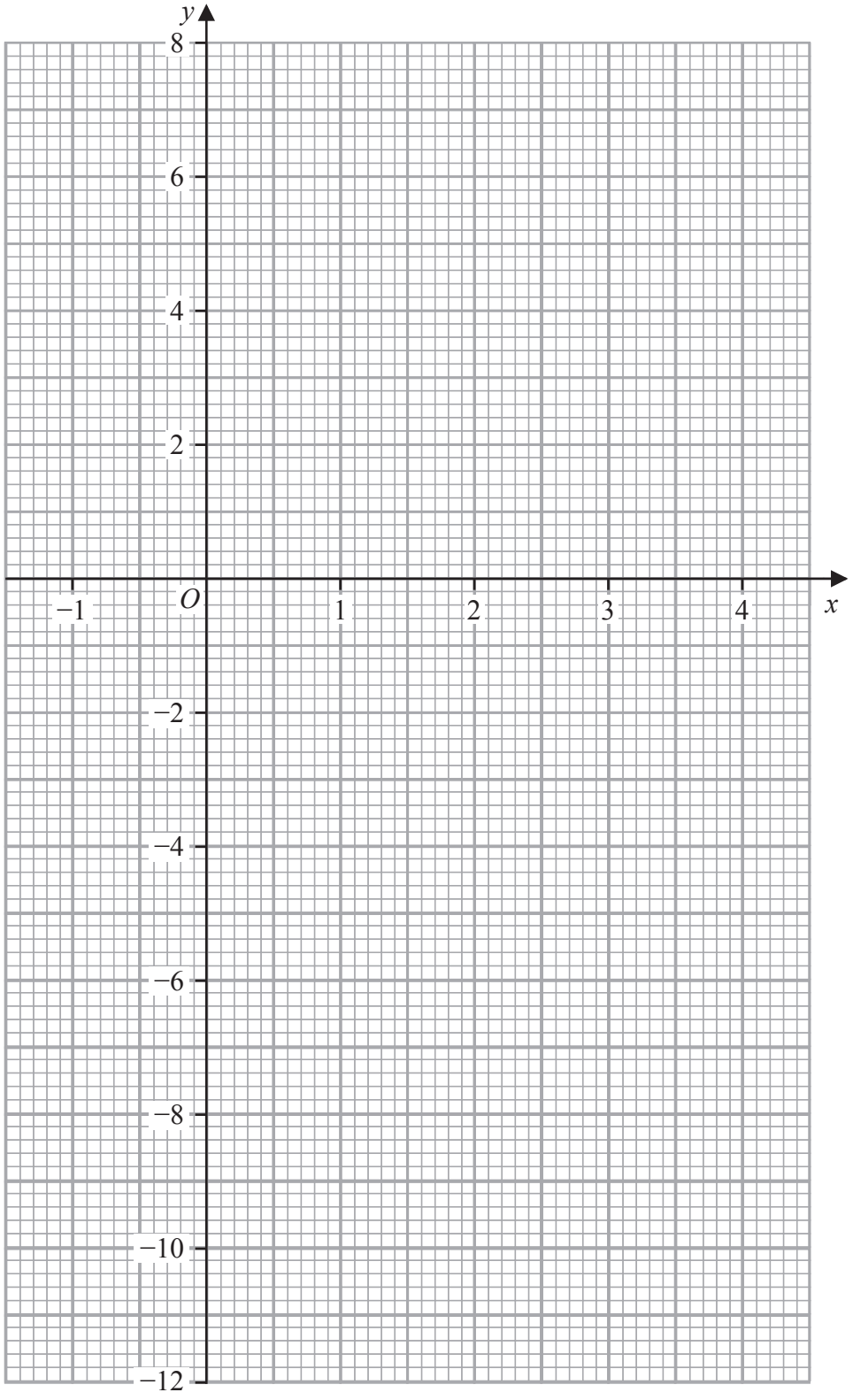
Question 9 continued



Turn over for a spare grid if you need to redraw your curve.

Question 9 continued

Only use this grid if you need to redraw your curve.



(Total for Question 9 is 12 marks)

10

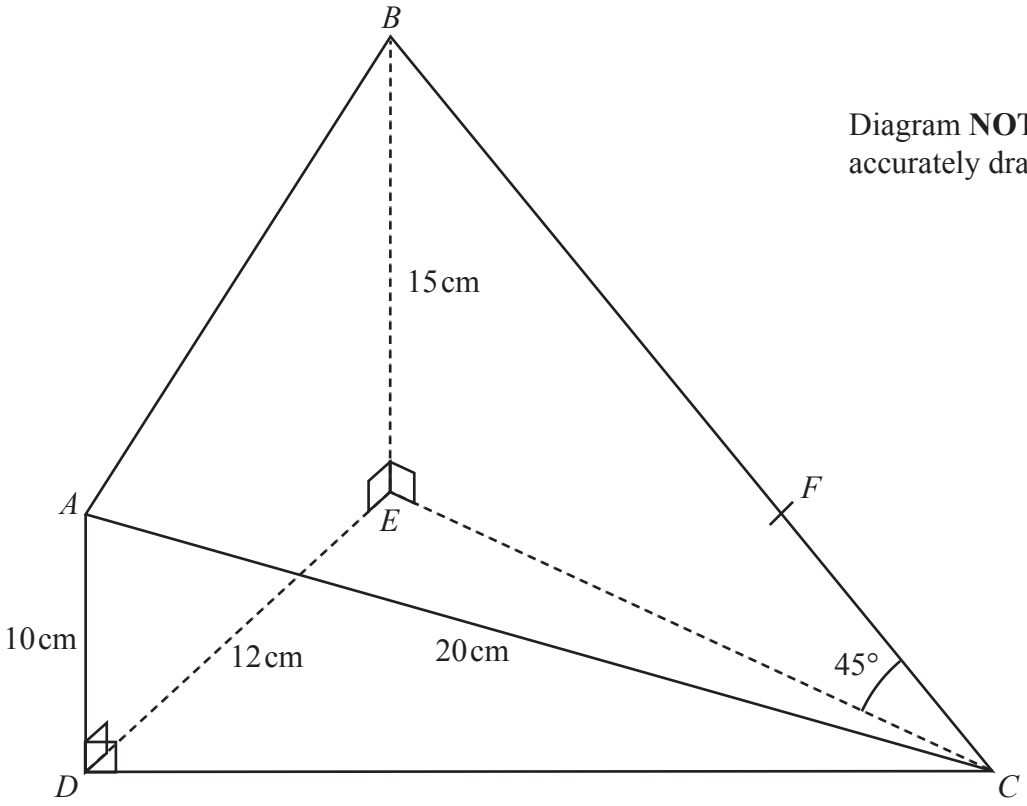


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Figure 4

Figure 4 shows solid *ABCDE*

The horizontal base *CDE* is a triangle.

The vertical face *ABED* is a trapezium.

The point *F* lies on *BC* such that $BF : FC = 2 : 1$

$AC = 20\,\text{cm}$ $AD = 10\,\text{cm}$ $BE = 15\,\text{cm}$ $DE = 12\,\text{cm}$

$\angle BCE = 45°$ $\angle ADC = \angle ADE = \angle BED = \angle BEC = 90°$

Calculate the length, in cm to one decimal place, of *AF*
Show all your working.

(7)

[Cosine rule: $a^2 = b^2 + c^2 - 2bc\cos A$]

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Question 10 continued

Question 10 continued

Question 10 continued

(Total for Question 10 is 7 marks)

11

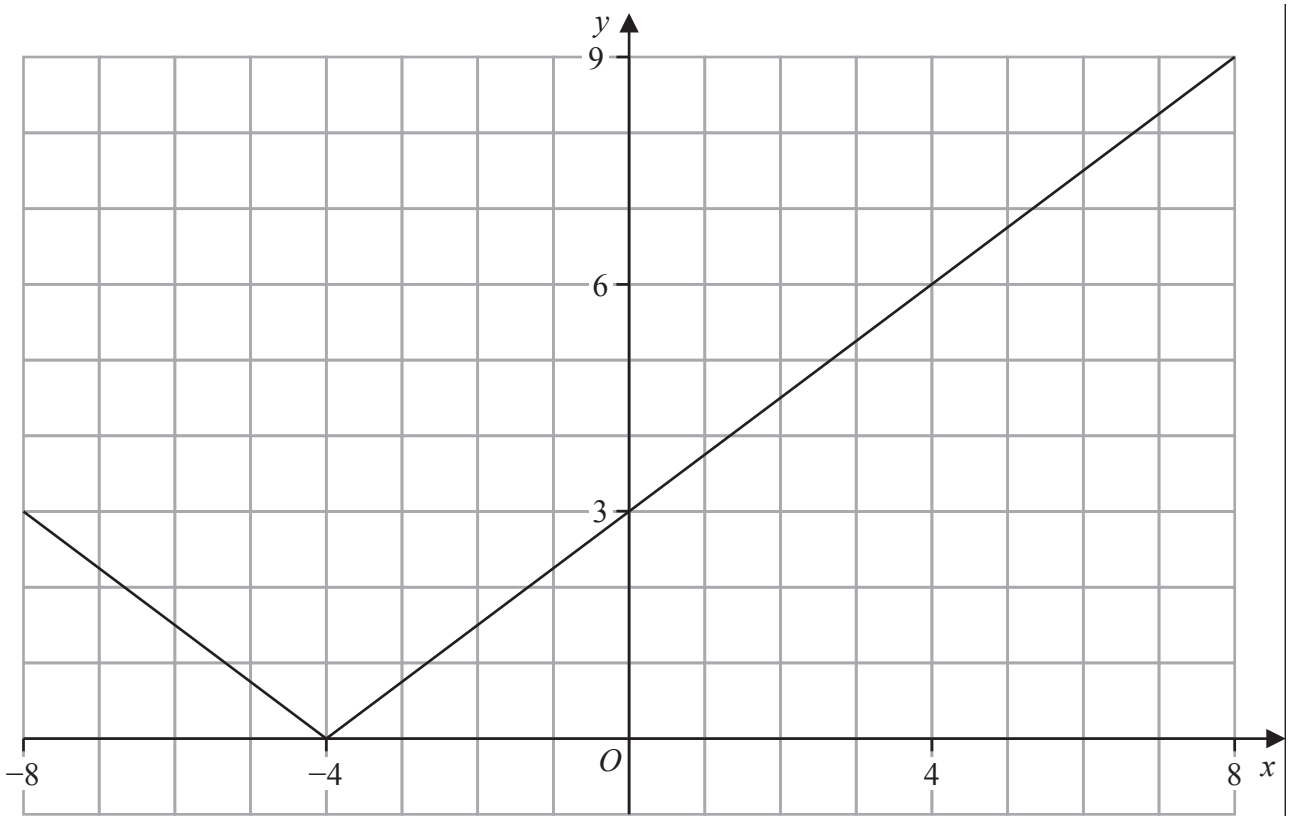

Figure 5

The function f has domain $-8 \leqslant x \leqslant 8$

Figure 5 shows the graph of $y = f(x)$, which consists of a line segment from (–8, 3) to (–4, 0) and a line segment from (–4, 0) to (8, 9)

(a) Write down the range of the function f

(2)

The function g is defined as

$$g : x \mapsto \frac{3x-1}{x+1}$$

(b) State the value of x which must be excluded from any domain of the function g

(1)

(c) Find gf(0)

(2)

(d) Find the inverse function g^{-1} in the form $g^{-1}(x) = \ldots$
Give your answer in its simplest form.

(4)

Question 11 continued

(Total for Question 11 is 9 marks)

12 A bag contains n sweets.

There are 9 orange sweets in the bag.
The rest of the sweets are purple.

Mina takes at random a sweet from the bag and eats it.
Stuart then takes at random a sweet from the bag and eats it.

The probability that Mina and Stuart both eat a sweet of the same colour is $\frac{46}{91}$

Find the probability that all 9 orange sweets remain in the bag.
Show clear algebraic working.

(6)

$$\left[\text{Solutions of } ax^2+bx+c=0 \text{ are } x=\frac{-b\pm\sqrt{b^2-4ac}}{2a}\right]$$

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Question 12 continued

Question 12 continued

Question 12 continued

(Total for Question 12 is 6 marks)

TOTAL FOR PAPER IS 100 MARKS

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