Please check the examination details below before entering your candidate information

Candidate surname	Other names

Centre Number | Candidate Number

Pearson Edexcel International GCSE

Monday 2 June 2025

Morning (Time: 1 hour 30 minutes)

Paper reference **4MB1/01R**

Mathematics B

PAPER 1R

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.

Turn over ▶

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Y:1/1/1/1/1/

P 7 9 5 1 7 A 0 1 2 8

Pearson

Answer all TWENTY SIX questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

1 Factorise fully $9x + 12x^2y$

.....

(Total for Question 1 is 2 marks)

2

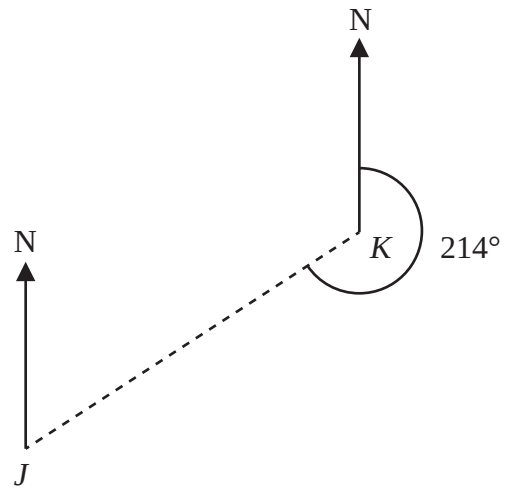


Diagram **NOT** accurately drawn

The diagram shows the position of two towns, J and K

The bearing of J from K is $214°$

Find the bearing, in degrees, of K from J

.....°

(Total for Question 2 is 2 marks)

3 Make x the subject of $t = 6(x + 4)$

.....

(Total for Question 3 is 2 marks)

4 The price of a television is reduced by 8% in a sale.
The price of the television in the sale is \$1012

Calculate the price of the television before the sale.

\$.....

(Total for Question 4 is 2 marks)

5 Simplify fully $\dfrac{\left(4xy^5\right)^3}{2xy}$

.....

(Total for Question 5 is 2 marks)

6 Given that, for all values of x,

$$x^2 + 6x - 15 = \left(x + a\right)^2 - b \text{ where } a \text{ and } b \text{ are integers}$$

find the value of a and the value of b

$a =$ .....

$b =$ .....

(Total for Question 6 is 2 marks)

7

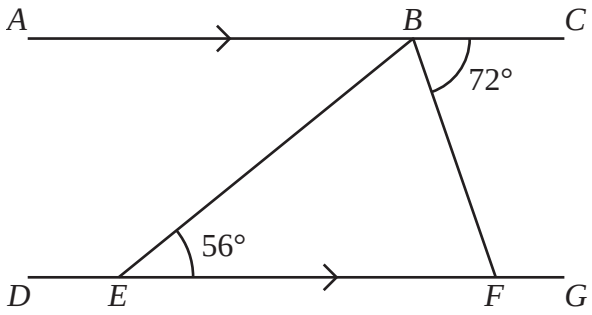


Diagram **NOT** accurately drawn

In the diagram *ABC* and *DEFG* are parallel straight lines.

$\angle BEF = 56°$ and $\angle CBF = 72°$

Find the size, in degrees, of $\angle EBF$
Give reasons for each stage of your working.

$\angle EBF =$ ..... °

(Total for Question 7 is 3 marks)

8 Here are the marks that 10 students scored in a test.

25 11 24 6 4 28 19 11 15 10

(a) Write down the mode of these 10 marks.

.....

(1)

(b) Find the median of these 10 marks.

.....

(2)

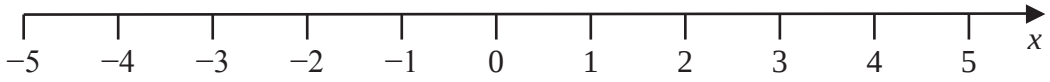
(Total for Question 8 is 3 marks)

9 (a) Solve the inequality $5y < 20 + 3y$

.....

(2)

(b) Represent the inequality $x \geqslant 1$ on the number line below.



(1)

(Total for Question 9 is 3 marks)

10 The cost, including delivery, of a mobile phone in the UK is £624

The cost of an identical mobile phone in the USA is \$448 plus an additional cost of \$*d* for delivery.

The cost, including delivery, of the mobile phone in the UK is £224 more than the cost, including delivery, of the mobile phone in the USA.

Using the exchange rate £1 = \$1.28

calculate the value of *d*

d = ...

(Total for Question 10 is 3 marks)

11 *A* and *B* are two points on horizontal ground.

The distance from *A* to *B* is 1.5 kilometres
BC is a vertical pole
The angle $CAB = 6°$

Calculate the height, in metres to 3 significant figures, of the pole.

..... metres

(Total for Question 11 is 3 marks)

12 Solid **A** and solid **B** are similar.

The surface area of solid **A** is $25\,cm^2$
The surface area of solid **B** is $900\,cm^2$
The volume of solid **A** is $50\,cm^3$

Calculate the volume, in cm^3, of solid **B**

..... cm^3

(Total for Question 12 is 3 marks)

13 On a trip, a powerboat travels at an average speed of 40 km/h for 1 hour 18 minutes and then travels at an average speed of 22 km/h for 30 minutes.

Calculate the average speed of the powerboat, in km/h, for the whole trip.

..... km/h

(Total for Question 13 is 4 marks)

14 Xiou records the time, in minutes, it takes each of the 30 students in his class to complete the same puzzle.

The table shows information about his results.

Time taken (t minutes)	**Frequency**
$0 \leqslant t < 2$	7
$2 \leqslant t < 4$	8
$4 \leqslant t < 6$	6
$6 \leqslant t < 8$	5
$8 \leqslant t < 10$	4

Calculate an estimate for the mean number of minutes that these students take to complete the puzzle.

..... minutes

(Total for Question 14 is 4 marks)

15 The points O, A and B are such that $\overrightarrow{OA} = \begin{pmatrix} -1 \\ 5 \end{pmatrix}$ and $\overrightarrow{OB} = \begin{pmatrix} -4 \\ 2 \end{pmatrix}$

The point C is such that $|AC| = \sqrt{125}$ and AC is parallel to OB

Find $\overrightarrow{BC}$

Give your answer in the form $\begin{pmatrix} c \\ d \end{pmatrix}$ where c and d are integers such that $c < 0$ and $d > 0$

Show all your working.

$\overrightarrow{BC} = \begin{pmatrix} \\ \\ \end{pmatrix}$

(Total for Question 15 is 4 marks)

16

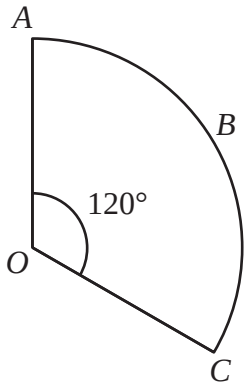


Diagram **NOT** accurately drawn

OABC is a sector of a circle, centre *O* with $\angle AOC = 120°$

The length of arc *ABC* is 17.2 cm

Calculate the area, in cm^2 to 3 significant figures, of the sector.

..... cm^2

(Total for Question 16 is 4 marks)

17 Without using a calculator and showing all your working, express

$$\frac{4 + 2\sqrt{7}}{3 - \sqrt{7}}$$

in the form $a + \sqrt{b}$ where a and b are integers.

.....

(Total for Question 17 is 4 marks)

18

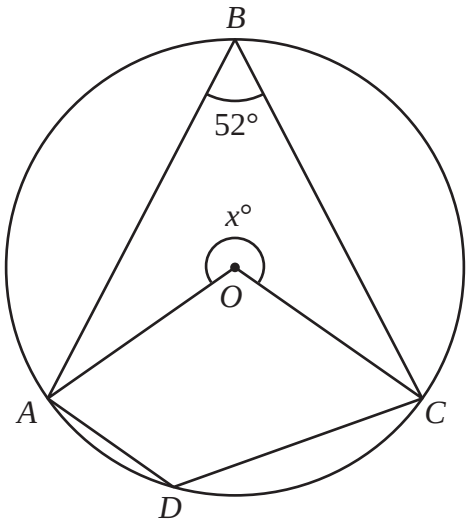


Diagram **NOT** accurately drawn

In the diagram A, B, C and D are points on a circle, centre O

$\angle ABC = 52°$ and the reflex angle $AOC = x°$

(a) Find the size, in degrees, of $\angle ADC$
Give a reason for your answer.

$\angle ADC =$ ..... °

(2)

(b) Find the value of x
Give a reason for your answer.

$x =$ .....

(3)

(Total for Question 18 is 5 marks)

19 (a) Calculate $3.6 \times 10^{103} \times 7.5 \times 10^{101}$
Give your answer in standard form.

.....

(2)

$c = 4 \times 10^{-8n}$ where n is an integer.

(b) Find an expression for $c^{-\frac{1}{2}}$ in terms of n
Give your answer in standard form.

.....

(3)

(Total for Question 19 is 5 marks)

20 The width of a rectangle is x metres.

The length of the rectangle is 8 metres longer than the width of the rectangle.

(a) Find an expression in terms of x for the perimeter, in metres, of the rectangle. Simplify your answer.

..... m

(2)

(b) Factorise $x^2 + 8x - 20$

.....

(2)

(c) Hence write down the range of values of x for which the area of the rectangle is greater than $20\,\text{m}^2$

.....

(1)

(Total for Question 20 is 5 marks)

21

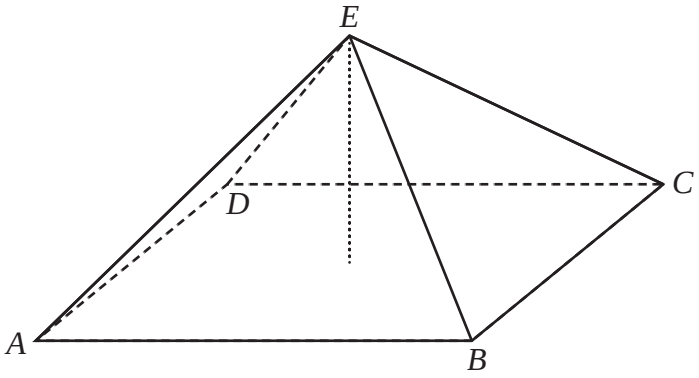


Diagram **NOT** accurately drawn

The diagram shows a right solid pyramid *ABCDE*, made of silver, with horizontal rectangular base *ABCD* and vertex *E*

$AB = 9\,\text{cm}$ to 1 significant figure.
$BC = 6.5\,\text{cm}$ to the nearest 0.5 cm.

The mass of the pyramid is 5080 grams to the nearest 10 grams.

The density of the silver is $10.5\,\text{g/cm}^3$ to 3 significant figures.

Given that $\text{density} = \dfrac{\text{mass}}{\text{volume}}$

calculate the upper bound, in cm to 3 significant figures, of the perpendicular height of the pyramid.
Show all your working.

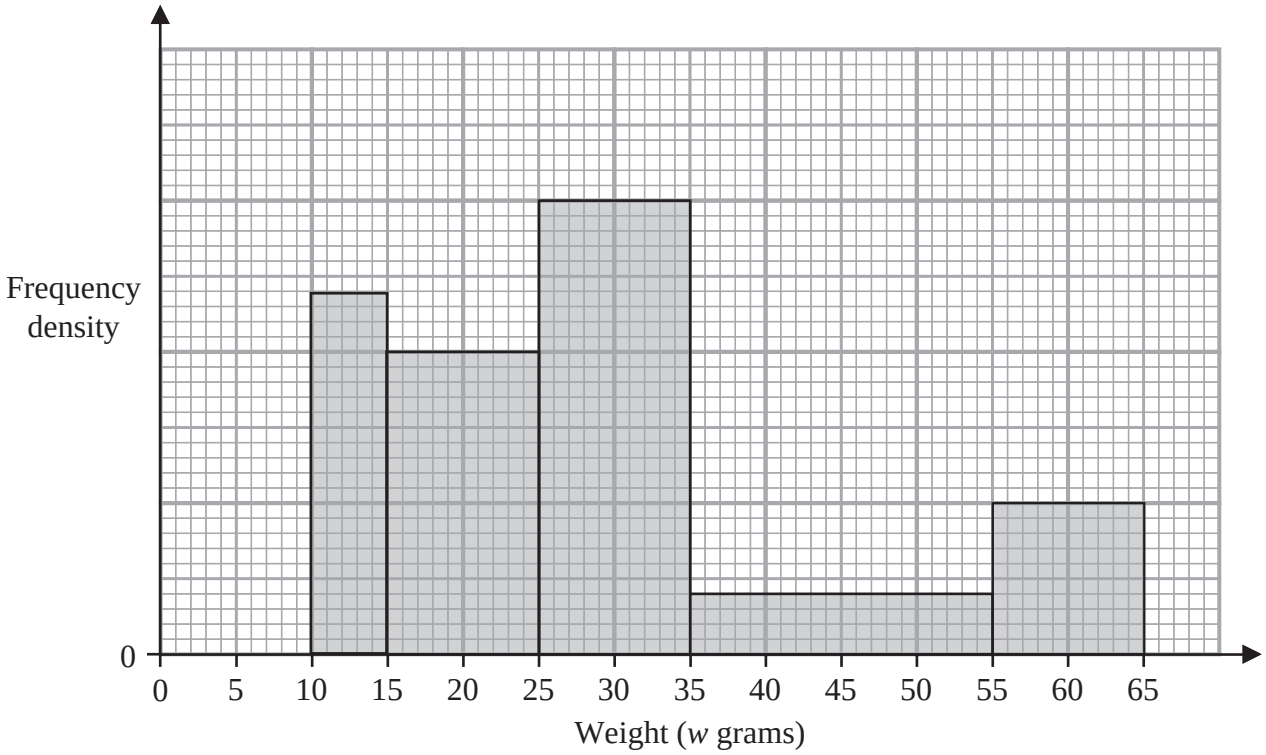
..... cm

(Total for Question 21 is 5 marks)

22 The weights, in grams, of tomatoes harvested by a gardener last month were measured.

The incomplete table and incomplete histogram below give information about the weight, in grams, of each tomato harvested last month.

Weight (w grams)	**Number of tomatoes**
$0 < w \leqslant 10$	x
$10 < w \leqslant 15$	24
$15 < w \leqslant 25$	40
$25 < w \leqslant 35$	60
$35 < w \leqslant 55$	y
$55 < w \leqslant 65$	20



(a) Show that $y = 16$

(2)

A tomato for which $w \leqslant 35$ grams is classed as a small tomato.

A small tomato is selected at random.

The probability that this tomato weighs less than or equal to 15 grams is $\frac{3}{8}$

(b) Complete the histogram.

(4)

(Total for Question 22 is 6 marks)

23

$$\mathbf{A} = \begin{pmatrix} -\frac{1}{2} & -2 \\ 0 & 1 \end{pmatrix} \qquad \mathbf{BA}^{-1} = \begin{pmatrix} x & -8 \\ 1 & x \end{pmatrix} \text{ where } x > 0$$

Given that the determinant of matrix $\mathbf{B}^{-1}$ is $-\frac{1}{6}$

find matrix $\mathbf{B}^{-1}$
Give the elements of this matrix as numbers.
Show all your working.

$\mathbf{B}^{-1} =$ $\begin{pmatrix} & \\ & \end{pmatrix}$

(Total for Question 23 is 5 marks)

24 Solve the simultaneous equations

$$9 - xy = x^2$$
$$4y - x = 11$$

Show clear algebraic working.

.....

(Total for Question 24 is 6 marks)

25

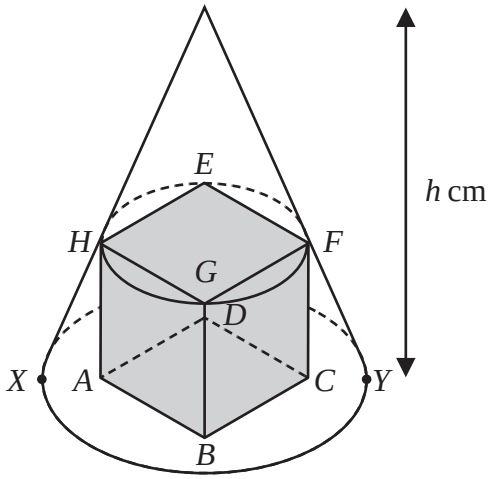


Diagram **NOT** accurately drawn

A cube *ABCDEFGH* of side 6 cm is placed inside a hollow cone of height *h* cm.

The face *ABCD* of the cube rests on the circular base of the cone.
The vertices *E*, *F*, *G* and *H* of the cube touch the curved surface of the cone.
X and *Y* are points on the circumference of the base of the cone such that *XACY* is a straight line.

Given that $XF = \sqrt{134}$ cm

find the value of *h*
Show all your working.

$h =$ .....

(Total for Question 25 is 5 marks)

Turn over for Question 26

26 The function g is defined by $\quad g : x \mapsto 3 - \frac{5}{x} \qquad x < 0$

(a) Find $g(-2)$

.....

(1)

(b) Find the range of g

.....

(2)

(c) Express the inverse function g^{-1} in the form $g^{-1} : x \mapsto ...$

$g^{-1} : x \mapsto$ .....

(3)

The function h is defined by $\text{h} : x \mapsto \dfrac{2}{2x - 3} \qquad x < 0$

(d) Express the composite function gh in the form $\text{gh} : x \mapsto \dfrac{ax + b}{c}$ where a, b and c are integers.

$\text{gh} : x \mapsto$ .....

(2)

(Total for Question 26 is 8 marks)

TOTAL FOR PAPER IS 100 MARKS

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