Please check the examination details below before entering your candidate information

Candidate surname	Other names

Centre Number | Candidate Number

Pearson Edexcel International GCSE

Tuesday 14 May 2024

Afternoon (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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P 7 3 4 9 5 A 0 1 2 4

Pearson

Answer all TWENTY SIX questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

1 Write 75 millimetres as a fraction of 3 metres.
Give your answer in its simplest form.

.....

(Total for Question 1 is 2 marks)

2 (a) Write 5.142 557 to 3 decimal places.

.....

(1)

(b) Write 6281 to 3 significant figures.

.....

(1)

(Total for Question 2 is 2 marks)

3 Simplify $\frac{8t^7v^3}{2t^2v}$

.....

(Total for Question 3 is 2 marks)

4 The nth term of a sequence is given by $7n^2 + 100$

(a) Find the 5th term of the sequence.

.....

(1)

Barney says that 37 is a term in the sequence.
Barney is wrong.

(b) Explain why Barney is wrong.

.....

.....

(1)

(Total for Question 4 is 2 marks)

5 Evaluate $\dfrac{6\times10^9 + 1.8\times10^8}{3\times10^2}$

Give your answer in standard form.

.....

(Total for Question 5 is 2 marks)

6 Simplify $(36a^8c^2)^{\frac{3}{2}}$

.....

(Total for Question 6 is 2 marks)

7 Without using a calculator and showing all your working, calculate

$$2\frac{1}{4} \div 2\frac{1}{7}$$

Give your answer as a mixed number in its simplest form.

.....

(Total for Question 7 is 3 marks)

8 Given that $y = 12x^3 + \frac{16}{x^2}$

find $\frac{dy}{dx}$

$\frac{dy}{dx} =$ .....

(Total for Question 8 is 3 marks)

9 $X = \frac{a}{c - f}$

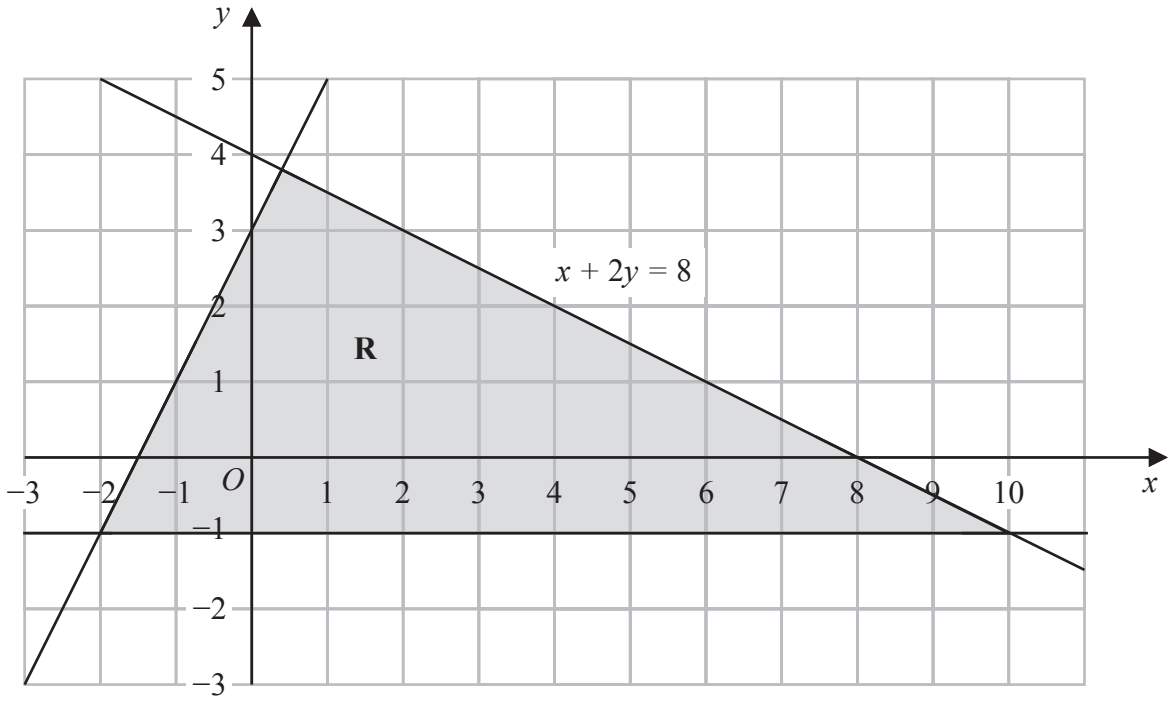
a = 40 to the nearest whole number
c = 2.2 to 1 decimal place
f = 0.6 to 1 decimal place

Calculate the upper bound for the value of X
Show your working clearly.

.....

(Total for Question 9 is 3 marks)

10



The region **R**, shown shaded in the diagram, is bounded by three straight lines.

Find three inequalities that define **R**

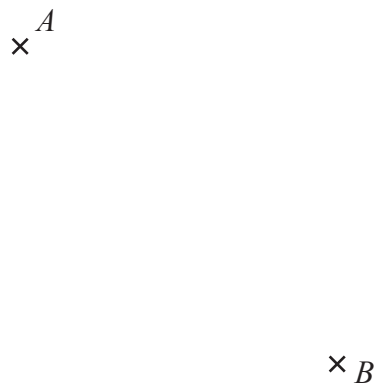
.....

.....

.....

(Total for Question 10 is 4 marks)

11 The diagram shows the point A and the point B



(a) Construct the locus of all points that are 4 cm from A

(1)

(b) Using ruler and compasses, and **showing all your construction lines**, construct the perpendicular bisector of AB

(2)

The region R consists of all the points that are nearer to B than to A and that are less than 4 cm from A

(c) Show, by shading, the region R
Label the region R

(1)

(Total for Question 11 is 4 marks)

12

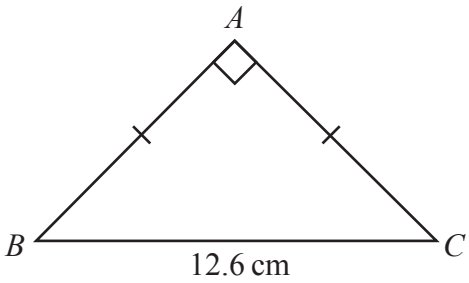


Diagram **NOT** accurately drawn

The diagram shows isosceles triangle ABC where $AB = AC$

$\angle BAC = 90°$ $BC = 12.6$ cm

Calculate the perimeter, in cm to one decimal place, of the triangle.

..... cm

(Total for Question 12 is 4 marks)

13

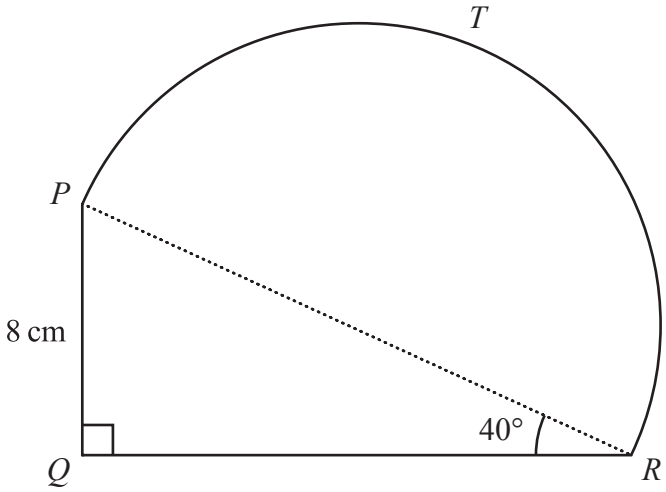


Diagram **NOT** accurately drawn

The diagram shows shape $PTRQ$ where PRQ is a triangle and PTR is a semicircle with diameter PR

$$\angle PQR = 90° \qquad \angle PRQ = 40° \qquad PQ = 8 \text{ cm}$$

Calculate the total area, in cm² to the nearest whole number, of shape $PTRQ$

..... cm^2

(Total for Question 13 is 4 marks)

14 Solve the simultaneous equations

$$2x + 6y = 14$$
$$3x + 5y = 10$$

Show clear algebraic working.

$x =$ .....

$y =$ .....

(Total for Question 14 is 4 marks)

15 Make y the subject of $c = \sqrt{\dfrac{3y + 5}{8 - y}}$

.....

(Total for Question 15 is 4 marks)

16

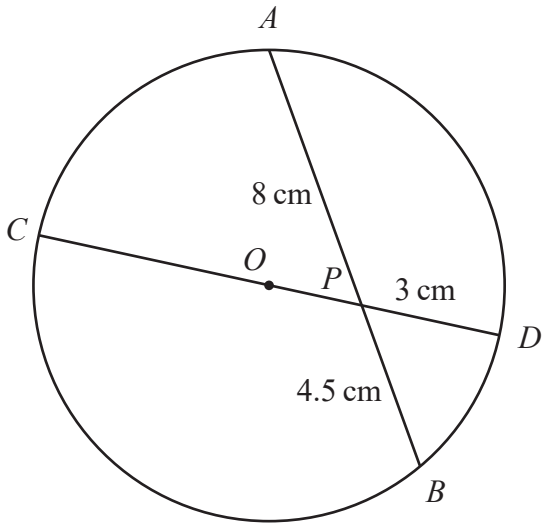


Diagram **NOT** accurately drawn

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

COD is a diameter of the circle.
AB is a chord of the circle.
COD and AB intersect at the point P

$AP = 8$ cm $PB = 4.5$ cm $PD = 3$ cm

Calculate the circumference, in cm to 3 significant figures, of the circle.

..... cm

(Total for Question 16 is 4 marks)

17 $\overrightarrow{OA} = \begin{pmatrix} 3 \\ -2 \end{pmatrix}$ $\overrightarrow{BA} = \begin{pmatrix} 5 \\ -9 \end{pmatrix}$

(a) Find the position vector of the point B

$\begin{pmatrix} \quad \\ \quad \end{pmatrix}$

(2)

(b) Calculate $\left|\overrightarrow{OB}\right|$, giving your answer as a surd.

$\left|\overrightarrow{OB}\right| =$ .....

(2)

(Total for Question 17 is 4 marks)

18 The table gives information about the heights, in cm, of 80 plants in a garden.

Height (h cm)	Frequency
$0 < h \leqslant 10$	2
$10 < h \leqslant 20$	26
$20 < h \leqslant 30$	10
$30 < h \leqslant 40$	24
$40 < h \leqslant 50$	18

(a) Find the class interval that contains the median height of these plants.

.....

(1)

(b) Calculate an estimate for the mean height, in cm, of these plants.

..... cm

(4)

(Total for Question 18 is 5 marks)

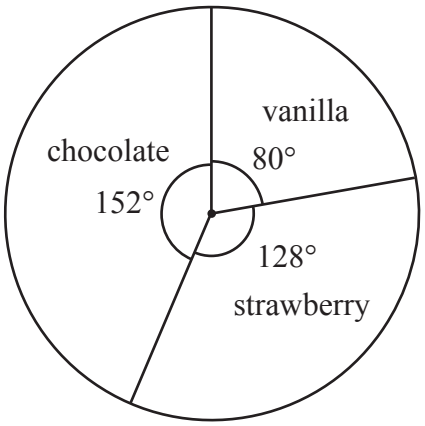
19 The students in class **7T** and the students in class **8Y** were asked to name their favourite ice cream flavour.

The table shows information about the favourite ice cream flavour for class **7T**
The pie chart shows information about the favourite ice cream flavour for class **8Y**

class **7T**

ice cream flavour	number of students
vanilla	$3x + 1$
strawberry	$5x - 12$
chocolate	$2x + 3$

class **8Y**



There are 32 students in class **7T**
There are 45 students in class **8Y**

More students in class **7T** than in class **8Y** said vanilla was their favourite ice cream flavour.

Find how many more.

.....

(Total for Question 19 is 5 marks)

20 (a) Solve $\frac{7+3y}{2}+5=4y-7$

Show clear algebraic working.

$y =$ .....

(3)

$A = 8x - 2w$

(b) Work out the value of x when $A = -35$ and $w = -4.5$

$x =$ .....

(2)

(Total for Question 20 is 5 marks)

21

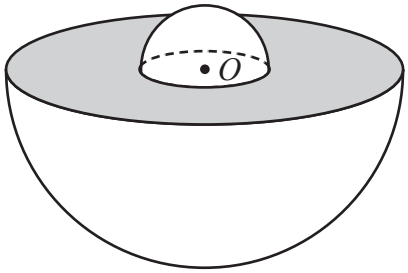


Diagram **NOT** accurately drawn

The diagram shows a solid shape made by joining a large hemisphere and a small hemisphere.

The centre of the base of the large hemisphere and the centre of the base of the small hemisphere meet at the point O

radius of large hemisphere : radius of small hemisphere = 3 : 1

The total surface area of the solid shape is 567π cm^2

Calculate the total volume, in cm^3 to 3 significant figures, of the solid shape.

..... cm^3

(Total for Question 21 is 5 marks)

Turn over for Question 22

22 (a) Express $\sqrt{50}+\sqrt{242}$ in the form $a\sqrt{a}$ where a is an integer.

.....

(2)

(b) Express $\dfrac{12}{\sqrt{5}-1}$ in the form $y\sqrt{x}+y$ where x and y are integers.

Show each stage of your working.

.....

(3)

(Total for Question 22 is 5 marks)

23 $(x+4)$ is a factor of $6x^3+kx^2-26x-24$, where k is a constant.

(a) Use the factor theorem to show that $k = 19$

(2)

(b) Hence solve $6x^3+19x^2-26x-24=0$
Show clear algebraic working.

.....

(4)

(Total for Question 23 is 6 marks)

24 There are only pink and yellow sweets in a bag containing N sweets.

There are 25 more pink sweets than yellow sweets.

Stan takes at random 2 sweets from the bag.

The probability that Stan takes 2 pink sweets from the bag is $\frac{7}{19}$

Find the probability that Stan takes 2 yellow sweets from the bag.
Show clear algebraic working.

.....

(Total for Question 24 is 6 marks)

Turn over for Question 25

25

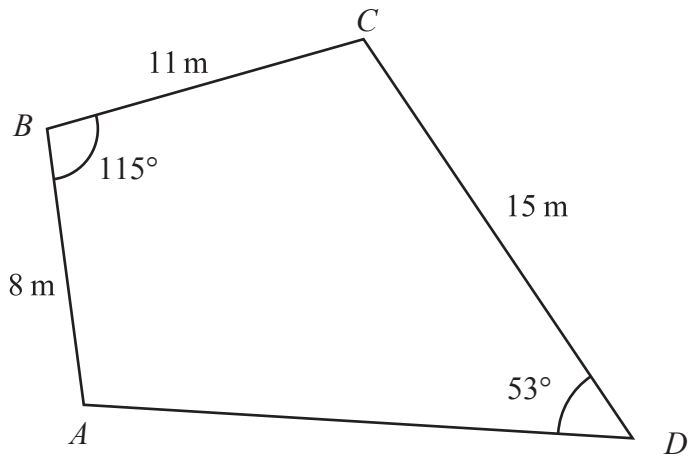


Diagram **NOT** accurately drawn

The diagram represents a small horizontal field $ABCD$

$AB = 8$ m $\quad BC = 11$ m $\quad CD = 15$ m

$\angle ABC = 115°$ $\quad \angle ADC = 53°$

Calculate, in m² to the nearest whole number, the area of the field.

..... m^2

(Total for Question 25 is 5 marks)

Turn over for Question 26

26 Show that $\left(\frac{6}{x-2}+\frac{4}{x+3}\right)\times\frac{5x^2-15x+10}{x^2-1}$ can be written in the form $\frac{p}{x+q}$ where p and q are integers to be found.

(Total for Question 26 is 5 marks)

TOTAL FOR PAPER IS 100 MARKS