Please check the examination details below before entering your candidate information

Candidate surname	Other names

Centre Number | Candidate Number

Pearson Edexcel International GCSE

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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Q:1/1/1/1/

P 6 9 3 0 9 A 0 1 2 4

Pearson

Answer ALL TWENTY SEVEN questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

1 Calculate the value of $\dfrac{2.89}{12.3 - 9.91}$

Give your answer as a decimal to 5 significant figures.

.....

(Total for Question 1 is 1 mark)

2 The nth term of a sequence is given by $7 - 4n$

Determine whether –123 is a term of this sequence.
Show your working clearly.

(Total for Question 2 is 2 marks)

3

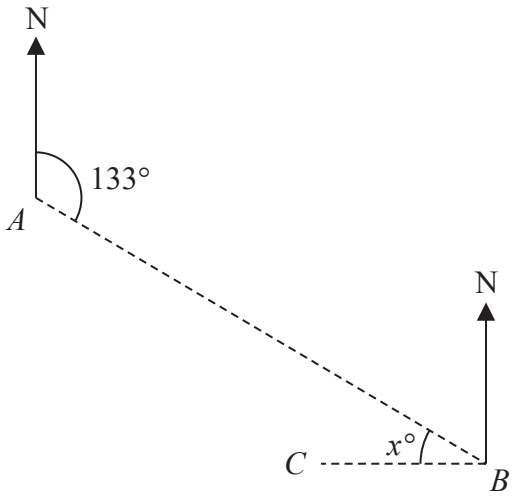


Diagram **NOT** accurately drawn

The diagram shows the position of two ports, A and B, and the position of a ship C
The bearing of port B from port A is 133°
Given that C is due west of B

calculate the value of x

$x =$ .....

(Total for Question 3 is 2 marks)

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

$$2\frac{7}{10} \times 3\frac{5}{9}$$

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

.....

(Total for Question 4 is 2 marks)

5 Make h the subject of $2(h - 6) = 4g + 2$

.....

(Total for Question 5 is 2 marks)

6 Solve the inequality $3 - 2x < 5 + 6x$

.....

(Total for Question 6 is 2 marks)

7 Here is a list of six numbers.

$$\frac{\sqrt{20}}{\sqrt{5}} \quad \frac{4\pi}{9\pi} \quad -3 \quad \frac{2^4}{4^2} \quad \frac{5}{2} \quad \frac{18}{\sqrt{3}}$$

Write down the two numbers in the list that are natural numbers.

..... , ...

(Total for Question 7 is 2 marks)

8

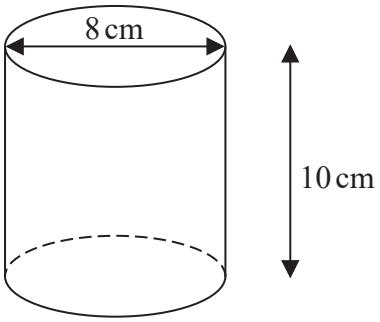


Diagram **NOT** accurately drawn

The diagram shows a right circular solid cylinder of diameter 8 cm and height 10 cm.

Calculate, to the nearest cm^3, the volume of the cylinder.

..... cm^3

(Total for Question 8 is 2 marks)

9 1 second = 10^6 microseconds.

Change 4.5×10^{14} microseconds into hours.
Give your answer in standard form.

..... hours

(Total for Question 9 is 2 marks)

10 Patrick sells a painting for 557.75 euros.
He makes a profit of 15% on the price he paid for the painting.

Calculate the price Patrick paid for the painting.

..... euros

(Total for Question 10 is 2 marks)

11 Here are the marks that Srinjoy scored in each of 7 tests.

21 24 25 18 28 25 20

(a) Write down the mode of these 7 marks.

.....

(1)

After taking an 8th test, Srinjoy's mean mark for all 8 tests is 22.5

(b) Calculate his mark for the 8th test.

.....

(2)

(Total for Question 11 is 3 marks)

12 (a) Find the value of $12xy - 15y$ when $x = 2$ and $y = -3$

.....

(1)

(b) Factorise completely $12xy - 15y$

.....

(2)

(Total for Question 12 is 3 marks)

13 The diagram shows a trapezium.

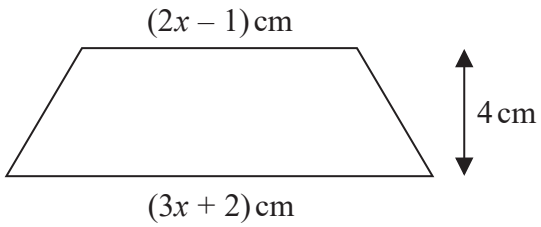


Diagram **NOT** accurately drawn

The lengths of the parallel sides of the trapezium are $(3x + 2)$ cm and $(2x - 1)$ cm.
The height of the trapezium is 4 cm.

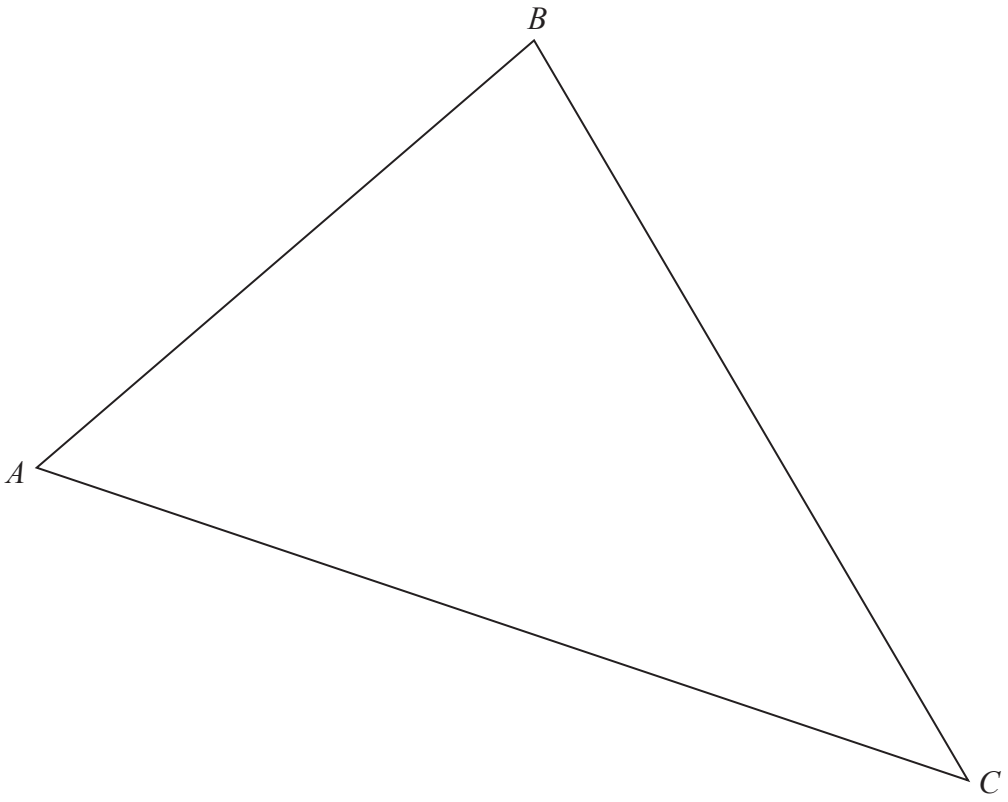
Given that the area of the trapezium is 28 cm^2

find the value of x

$x =$ .....

(Total for Question 13 is 3 marks)

14



The diagram shows a farmer's field that is in the shape of a ΔABC

The farmer is going to grow carrots in the region of the field which is

- nearer to A than to B

and

- nearer to AB than to AC

Using ruler and compasses only and **showing all your construction lines**, construct the region T inside the field in which the farmer is going to grow his carrots.

Shade the region and label it T

(Total for Question 14 is 3 marks)

15

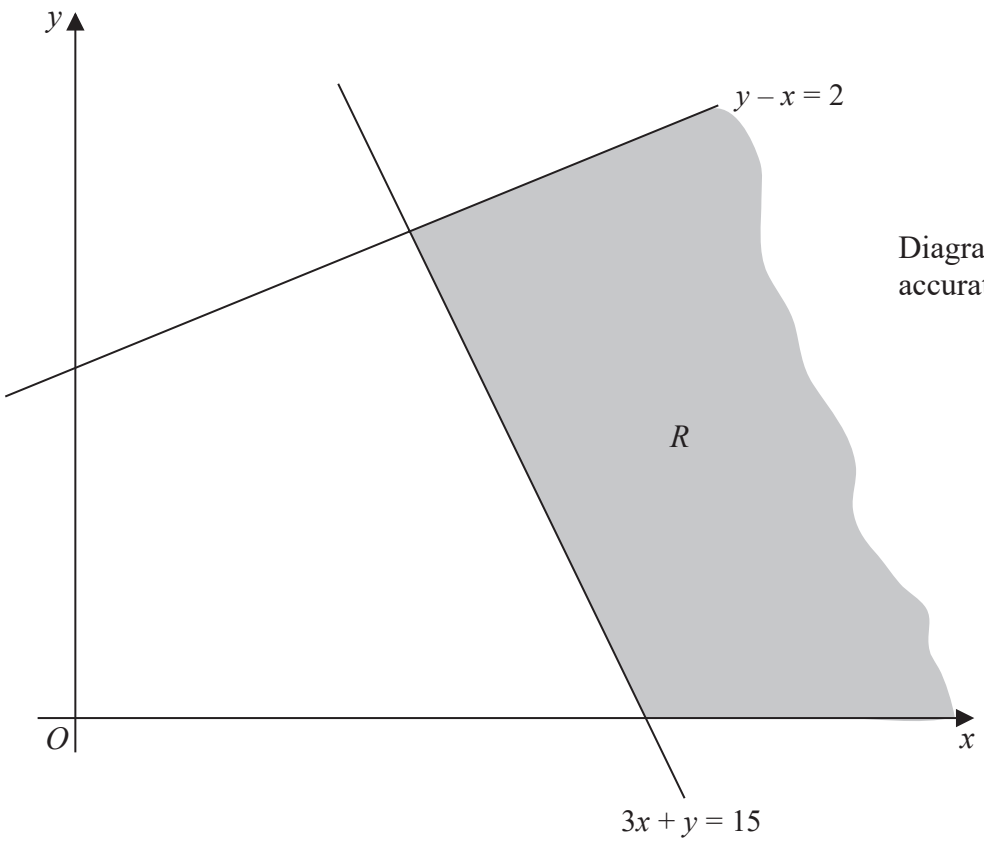


Diagram **NOT** accurately drawn

The diagram shows part of the shaded infinite region R which has three straight boundary lines.

Write down the three inequalities that define the shaded region R

.....

.....

.....

(Total for Question 15 is 3 marks)

16

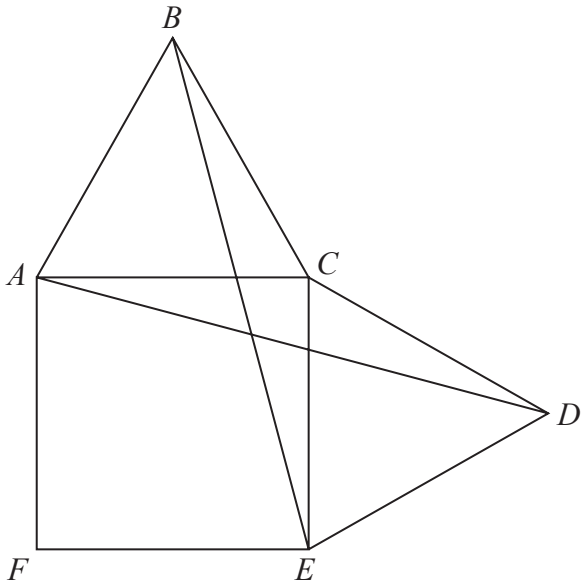


Diagram **NOT** accurately drawn

The diagram shows the square $ACEF$ and the equilateral triangles ABC and CDE

Prove that ΔECB is congruent to ΔACD

(Total for Question 16 is 3 marks)

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

$$\frac{4 - 2\sqrt{3}}{\sqrt{3} + 1}$$

in the form $a\sqrt{3} + b$ where a and b are integers.

.....

(Total for Question 17 is 3 marks)

18

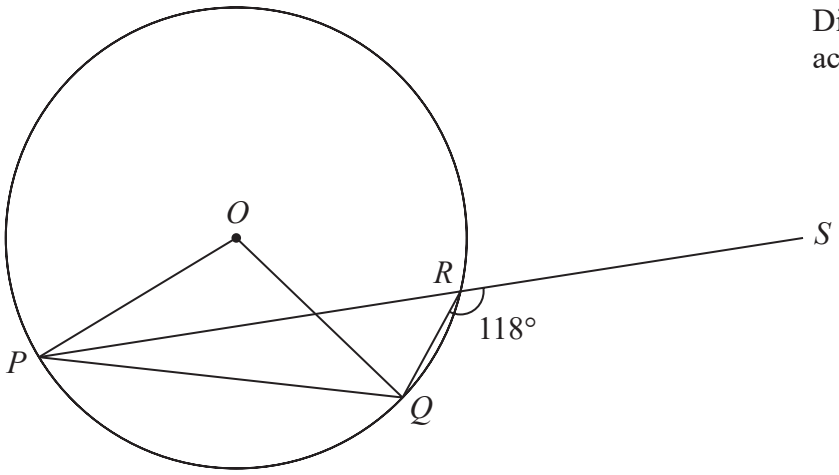


Diagram **NOT** accurately drawn

In the diagram, P, Q and R are points on a circle with centre O

PRS is a straight line and $\angle QRS = 118°$

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

$\angle OQP =$ ..... °

(Total for Question 18 is 4 marks)

19

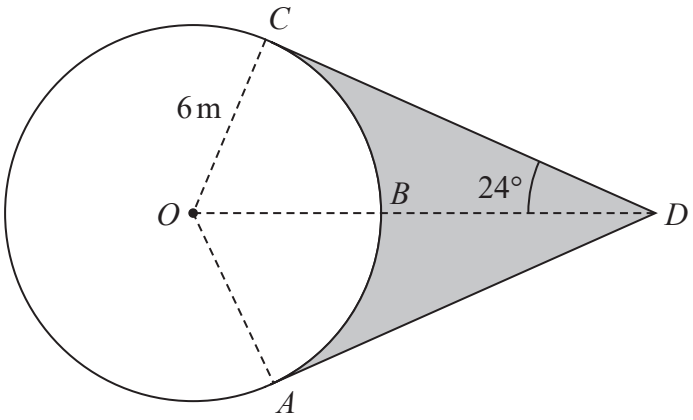


Diagram **NOT** accurately drawn

In the diagram A, B and C are points on a circle with centre O and radius 6 m.
AD and CD are tangents to the circle.

OBD is a straight line such that $\angle ODC = 24°$

Calculate the perimeter, in m to 3 significant figures, of the shaded region.

..... m

(Total for Question 19 is 4 marks)

20 The incomplete table and incomplete histogram give information about the length of time, in minutes, that each of 105 runners took to complete a half marathon.

Time (t minutes)	Frequency
$0 < t \leqslant 70$	35
$70 < t \leqslant 80$	
$80 < t \leqslant 90$	10
$90 < t \leqslant 110$	15
$110 < t \leqslant 130$	
$130 < t \leqslant 190$	

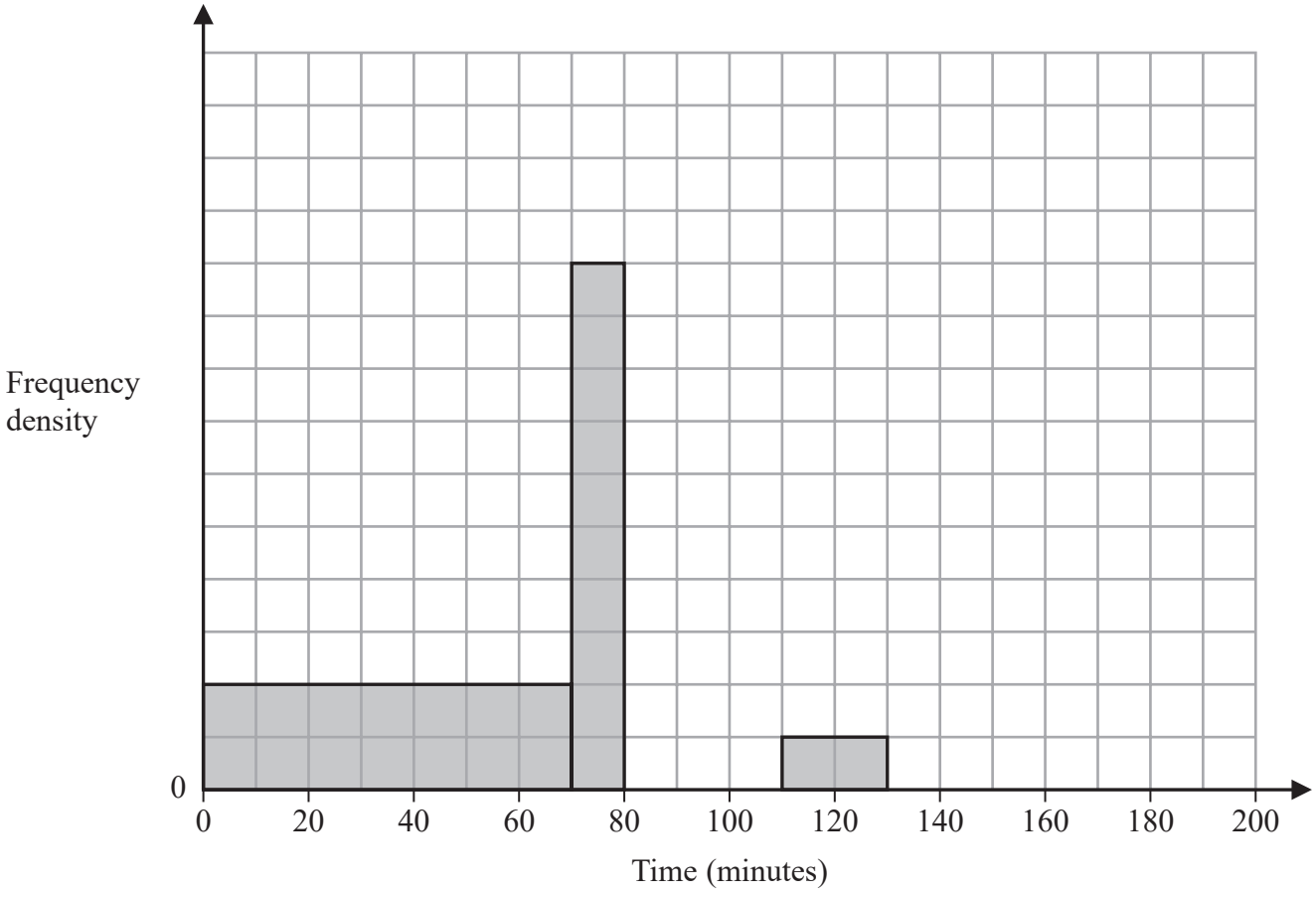
None of the 105 runners took longer than 190 minutes to complete the half marathon.

(a) Use this information and the information in the histogram to complete the table.

(2)

(b) Use the information in the table to complete the histogram.

(2)



(Total for Question 20 is 4 marks)

21 The points A and B are such that the coordinates of A are $(3, -2)$ and $\overrightarrow{BA} = \begin{pmatrix} -1 \\ 4 \end{pmatrix}$

(a) Find the coordinates of point B

(..... , ...)

(2)

The point C has coordinates (m, n) where $m > 3$

Given that $\left|\overrightarrow{AC}\right| = 5$

(b) find an expression for m in terms of n

$m =$ .....

(3)

(Total for Question 21 is 5 marks)

22

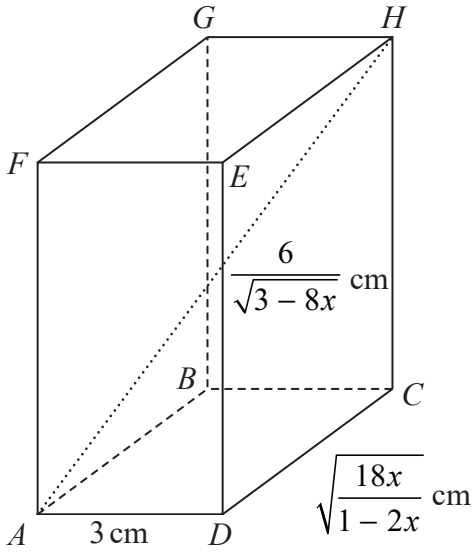


Diagram **NOT** accurately drawn

The diagram shows cuboid $ABCDEFGH$ in which

$AD = 3$ cm $\qquad DC = \sqrt{\dfrac{18x}{1-2x}}$ cm $\qquad AH = \dfrac{6}{\sqrt{3-8x}}$ cm

where $0 < x < \dfrac{3}{8}$

Given that the length of CH is L cm, where $L = \dfrac{k}{\sqrt{(3-8x)(1-2x)}}$ and k is a positive integer,

(a) find the value of k
Show your working clearly.

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

$k =$ .....

(5)

Given that $x = 0.3$

(b) calculate the volume, in cm^3, of the cuboid.

..... cm^3

(2)

(Total for Question 22 is 7 marks)

23 A dice has eight faces numbered 1, 2, 3, 4, 5, 6, 7 and 8

The table shows information about the probability that, when the dice is rolled once, it will land on each of the possible numbers.

Number	1	2	3	4	5	6	7	8
Probability	$\frac{1}{2}y$	0.1	$2x - 4$	0.05	$3y - 1$	$x - 2$	0.12	0.03

When the dice is rolled once, the probability that the dice will land on the number 5 is 0.2

The dice is rolled 250 times.

Calculate an estimate for the number of times the dice will land on an odd number.

.....

(Total for Question 23 is 6 marks)

24 $\mathbf{A} = \begin{pmatrix} -2 & 1 \\ -3 & 4 \end{pmatrix}$ $\mathbf{B} = \begin{pmatrix} 3 & 2 \\ 2 & 2 \end{pmatrix}$

Find

(a) $\mathbf{A} - \mathbf{B}$

$\begin{pmatrix} & \\ & \end{pmatrix}$

(2)

(b) $3\mathbf{A} + 2\mathbf{B}$

$\begin{pmatrix} & \\ & \end{pmatrix}$

(2)

The matrix $\mathbf{C}$ is such that $\mathbf{A} = \mathbf{BC}$

(c) Find $\mathbf{C}$

$\mathbf{C} = \begin{pmatrix} & \\ & \end{pmatrix}$

(4)

(Total for Question 24 is 8 marks)

25

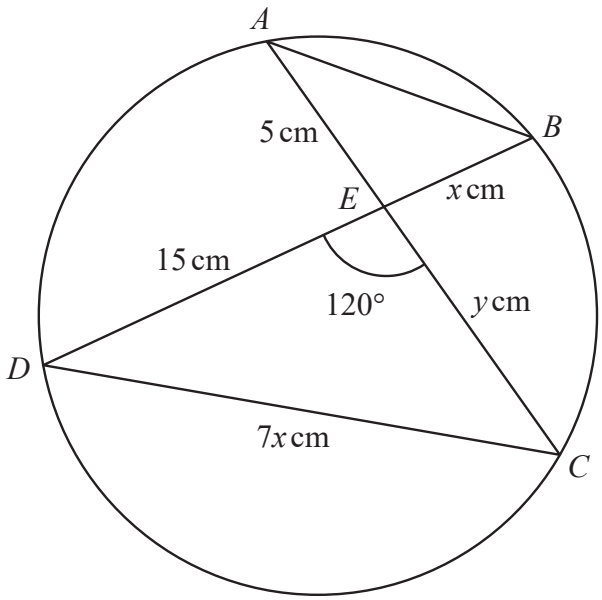


Diagram **NOT** accurately drawn

A, B, C and D are four points on a circle.

The chord AC intersects the chord BD at E

$AE = 5\,\text{cm}$ $EC = y\,\text{cm}$ $DE = 15\,\text{cm}$ $EB = x\,\text{cm}$ $DC = 7x\,\text{cm}$ $\angle DEC = 120°$

(a) Find the value of x and the value of y
Show your working clearly.

$x =$ .....

$y =$ .....

(6)

Given that

$$\text{area of } \Delta ABE : \text{area of } \Delta CDE = 1 : n$$

(b) find the value of n

$n =$ .....

(2)

(Total for Question 25 is 8 marks)

26 The equation of a curve **C** is $y = (kx^2 - 2)(x + 3)$, where k is a constant.

The point A on **C** has x coordinate equal to -1
The tangent to **C** at A has gradient equal to -8

(a) Show that the x coordinates of the stationary points on **C** satisfy the equation

$$3x^2 + 6x - 1 = 0$$

(5)

(b) Write $3x^2 + 6x - 1$ in the form $a(x + b)^2 + c$ where a, b and c are integers.

.....

(3)

(c) Hence find the exact x coordinate of each of the stationary points on **C**
Show your working clearly.

.....

(2)

(Total for Question 26 is 10 marks)

Turn over for Question 27

27 x is directly proportional to w^3

y is inversely proportional to $\sqrt{w}$

$y = 2$ when $x = \frac{1}{4}$

Find the value of p and the value of q such that $xy^p = q$

$p =$ .....

$q =$ .....

(Total for Question 27 is 4 marks)

TOTAL FOR PAPER IS 100 MARKS