

Please check the examination details below before entering your candidate information

Candidate surname

Other names

Centre Number

Candidate Number

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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/




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 $\frac{2.89}{12.3 - 9.91}$

Give your answer as a decimal to 5 significant figures.

.....
(Total for Question 1 is 1 mark)

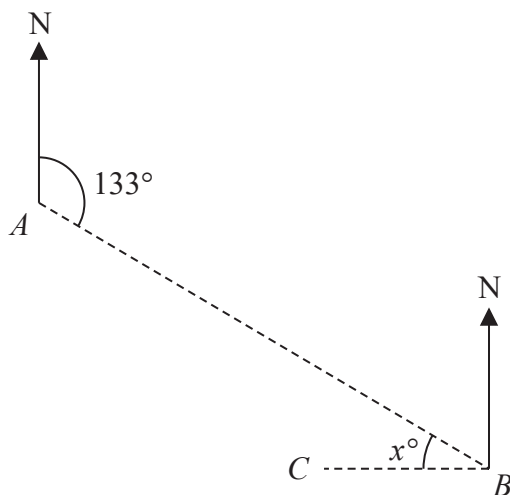
2 The n th term of a sequence is given by $7 - 4n$

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

$x = \dots\dots\dots$

(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.

$\dots\dots\dots$

(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

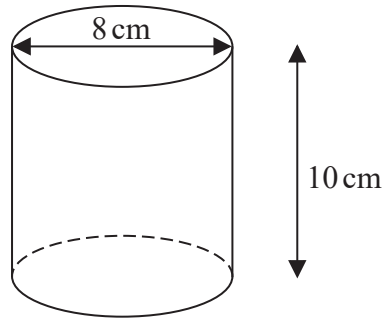


Diagram **NOT**
accurately drawn

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.

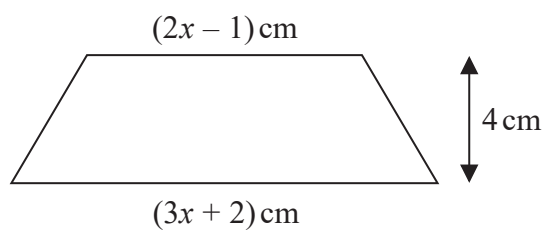


Diagram **NOT**
accurately drawn

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

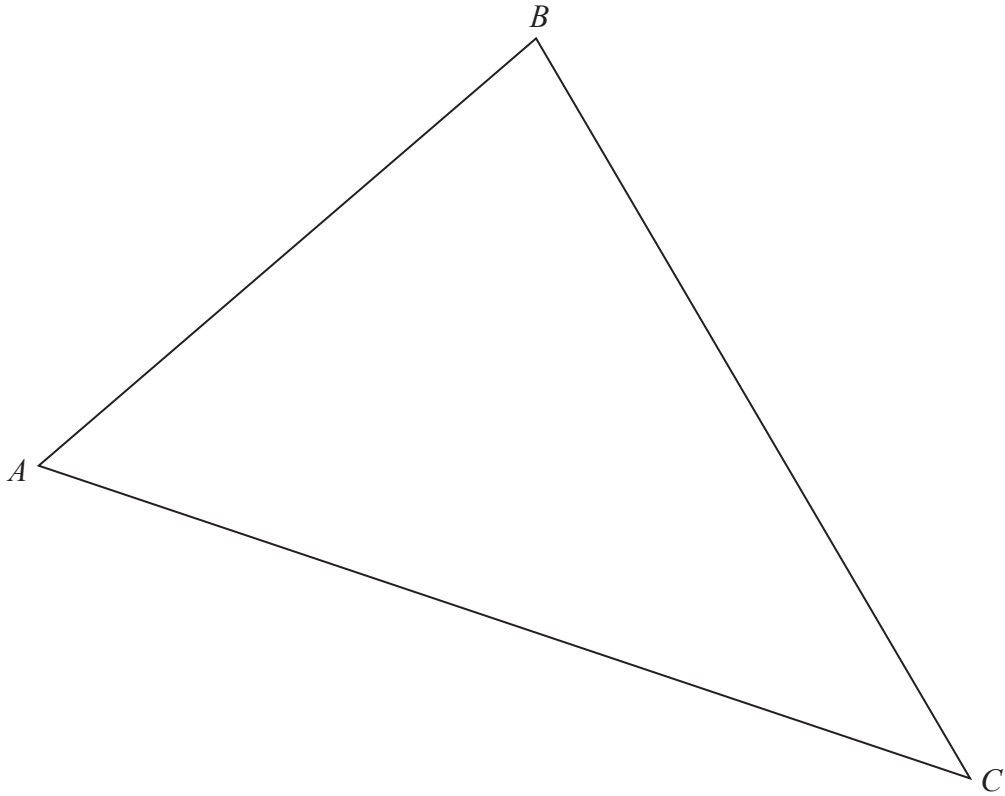
Given that the area of the trapezium is 28 cm^2

find the value of x

$x =$

(Total for Question 13 is 3 marks)





The diagram shows a farmer's field that is in the shape of a $\triangle ABC$

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

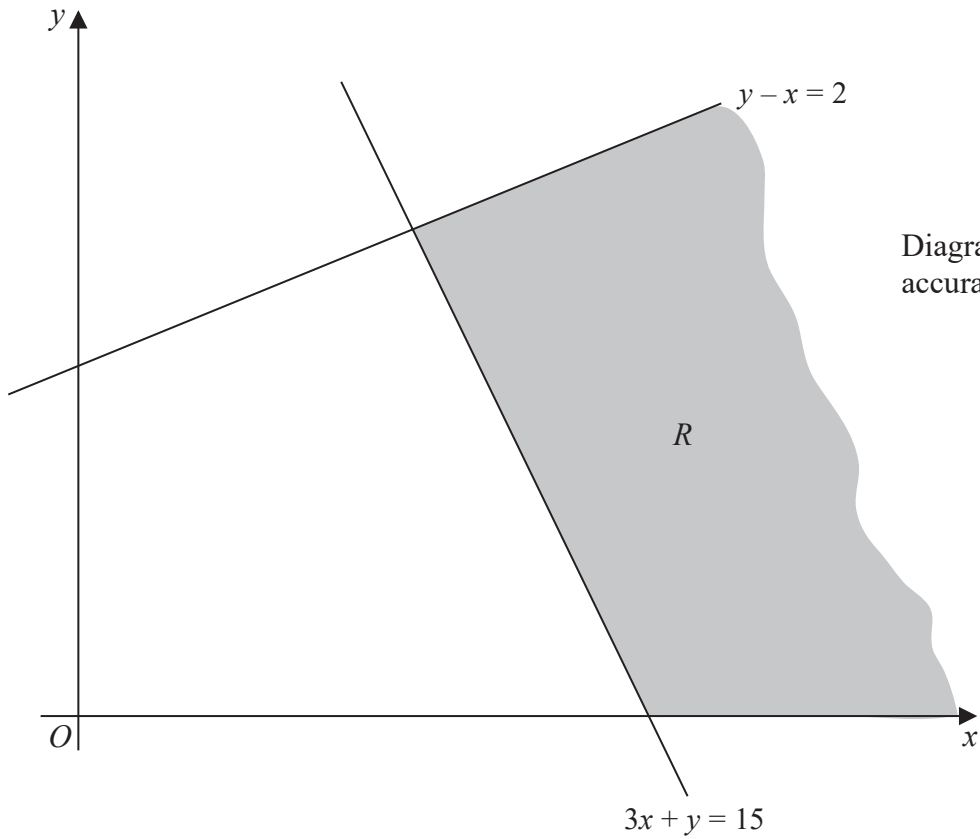
Using ruler and compasses only and **showing all your construction lines**, construct the region T inside the field in which the farmer is going to grow his carrots.

Shade the region and label it T

(Total for Question 14 is 3 marks)



15



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)

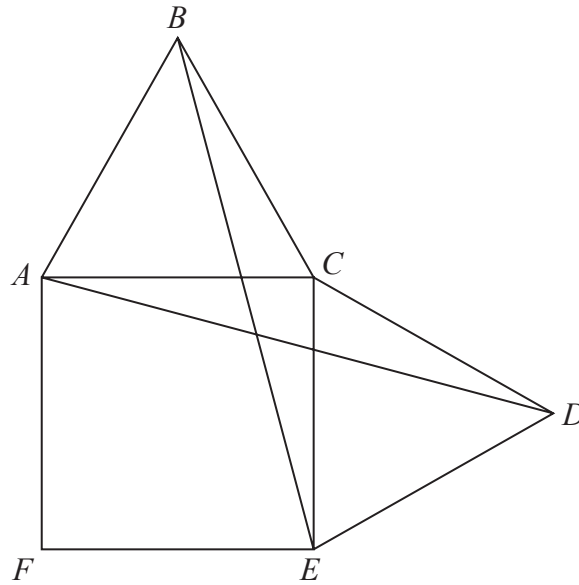
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Diagram **NOT**
accurately drawn



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

Prove that $\triangle ECB$ is congruent to $\triangle ACD$

(Total for Question 16 is 3 marks)

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

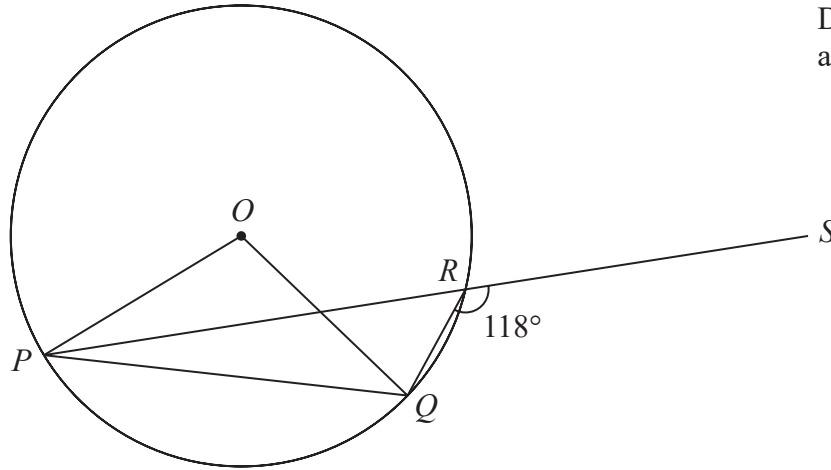
$$\frac{4 - 2\sqrt{3}}{\sqrt{3} + 1}$$

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

.....
(Total for Question 17 is 3 marks)



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 $\angle QRS = 118^\circ$

Calculate, in degrees, the size of $\angle OQP$

Give reasons for each stage of your working.

$\angle OQP = \dots\dots\dots^\circ$

(Total for Question 18 is 4 marks)

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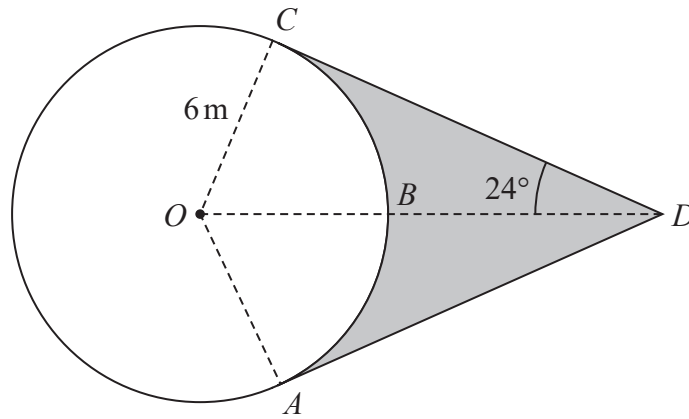
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19

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 $\angle ODC = 24^\circ$

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

..... m

(Total for Question 19 is 4 marks)

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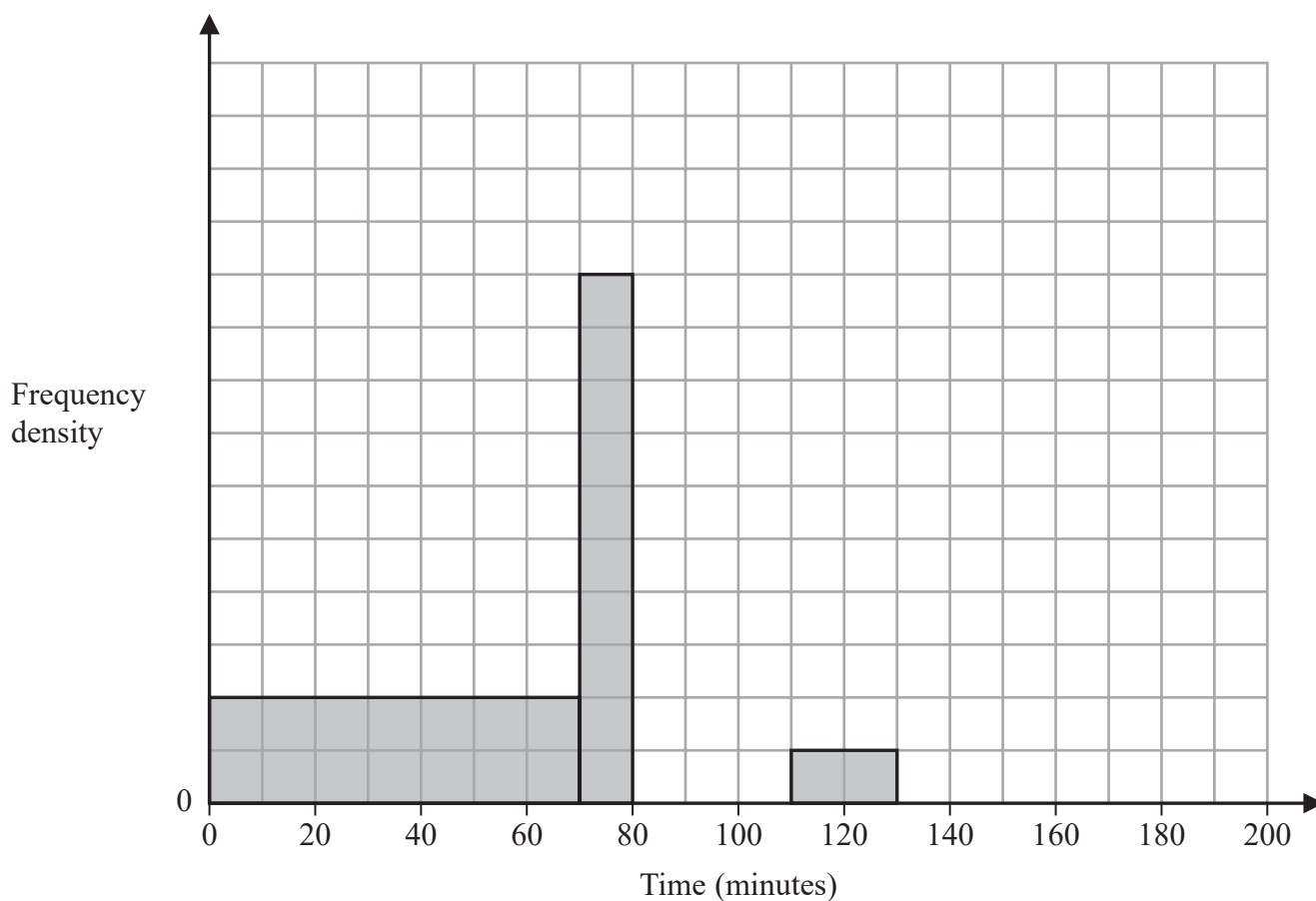


- 20 The incomplete table and incomplete histogram give information about the length of time, in minutes, that each of 105 runners took to complete a half marathon.

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

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 $\vec{BA} = \begin{pmatrix} -1 \\ 4 \end{pmatrix}$

(a) Find the coordinates of point B

(.....,)
(2)

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

Given that $|\vec{AC}| = 5$

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

$m = \dots\dots\dots$
(3)

(Total for Question 21 is 5 marks)



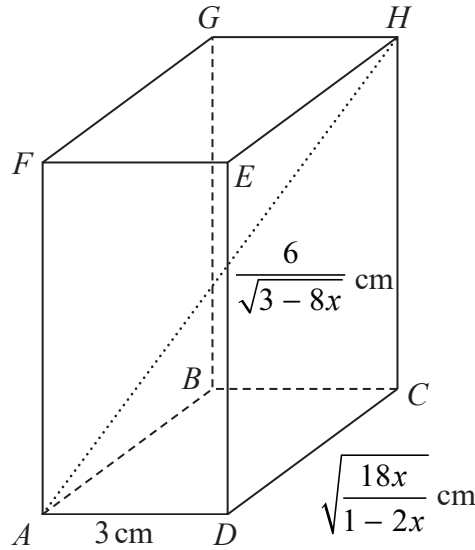


Diagram NOT accurately drawn

The diagram shows cuboid $ABCDEFGH$ in which

$$AD = 3 \text{ cm} \quad DC = \sqrt{\frac{18x}{1-2x}} \text{ cm} \quad AH = \frac{6}{\sqrt{3-8x}} \text{ cm}$$

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

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

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

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$$k = \dots\dots\dots (5)$$

Given that $x = 0.3$

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

$$\dots\dots\dots \text{cm}^3 (2)$$

(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)



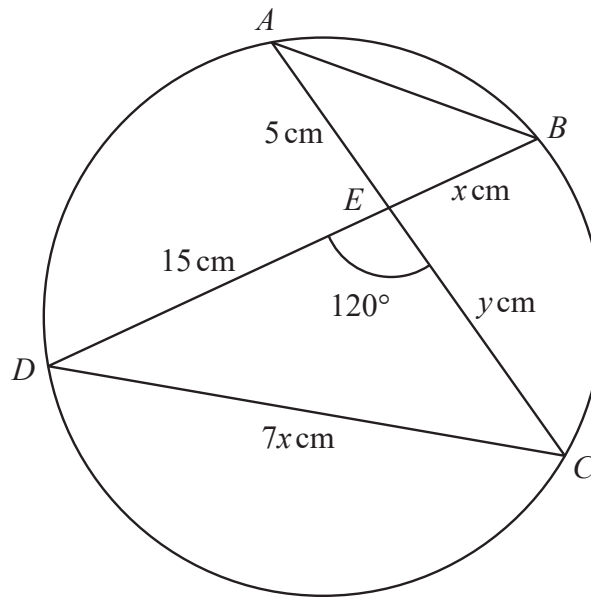


Diagram **NOT**
accurately drawn

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

The chord AC intersects the chord BD at E

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

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



$$x = \dots\dots\dots$$

$$y = \dots\dots\dots$$

(6)

Given that

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

(b) find the value of n

$$n = \dots\dots\dots$$

(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)



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(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}

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

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

$$p = \dots\dots\dots$$

$$q = \dots\dots\dots$$

(Total for Question 27 is 4 marks)

TOTAL FOR PAPER IS 100 MARKS

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