

Write your name here

Surname

Other names

Pearson Edexcel
International GCSE

Centre Number

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Candidate Number

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Mathematics B

Paper 1R



Thursday 26 May 2016 – Morning
Time: 1 hour 30 minutes

Paper Reference

4MB0/01R

You must have: Ruler graduated in centimetres and millimetres, protractor, 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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PEARSON

Answer ALL TWENTY EIGHT questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

1 Write down $\frac{1}{24}$ as a decimal

(a) correct to 3 decimal places,

.....
(1)

(b) correct to 3 significant figures.

.....
(1)

(Total for Question 1 is 2 marks)

2 Sarah wants to change 385 US dollars into British pounds (£).

Given that £1 = 1.54 US dollars, calculate how much she should get for 385 US dollars.

£.....

(Total for Question 2 is 2 marks)

3 The n th term of a sequence is $2 - 7n$

Find the difference between the 4th term and the 8th term of this sequence.

.....
(Total for Question 3 is 2 marks)

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- 4 Express $\sqrt{832}$ in the form $4\sqrt{n}$, where n is an integer.

Show all your working.

(Total for Question 4 is 2 marks)

5 $\mathbf{a} = \begin{pmatrix} 6 \\ -2 \end{pmatrix}$ $\mathbf{b} = \begin{pmatrix} 2 \\ 3 \end{pmatrix}$

Given that $3\mathbf{a} = 4\mathbf{b} - \mathbf{x}$, find \mathbf{x}

$$\mathbf{x} = \begin{pmatrix} \\ \end{pmatrix}$$

(Total for Question 5 is 2 marks)

- 6 The selling price of a TV is the cost price of the TV plus profit. The profit is 20% of the cost price.

The selling price of the TV is £450

Calculate the cost price of the TV.

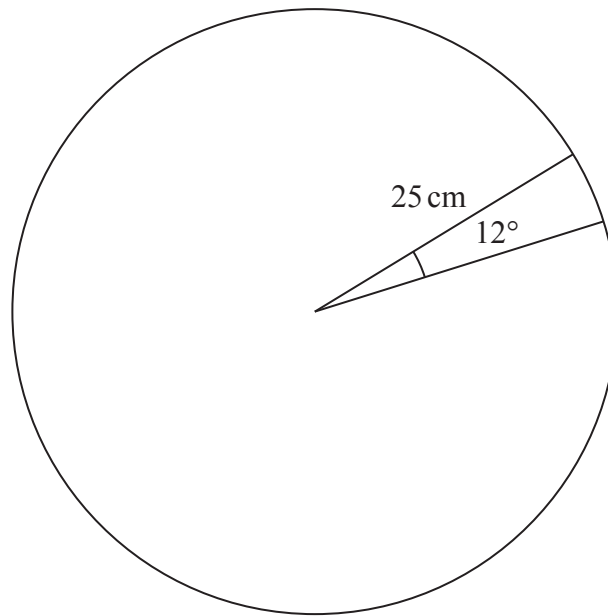
£.....

(Total for Question 6 is 2 marks)



7

Diagram NOT accurately drawn



The radius of a circle is 25 cm.
An arc of the circle subtends an angle of 12° at the centre of the circle.
Calculate the length, in cm to 1 decimal place, of this arc.

..... cm

(Total for Question 7 is 2 marks)

8 Solve the inequality $3 - 5x < 2x + 17$

.....

(Total for Question 8 is 2 marks)

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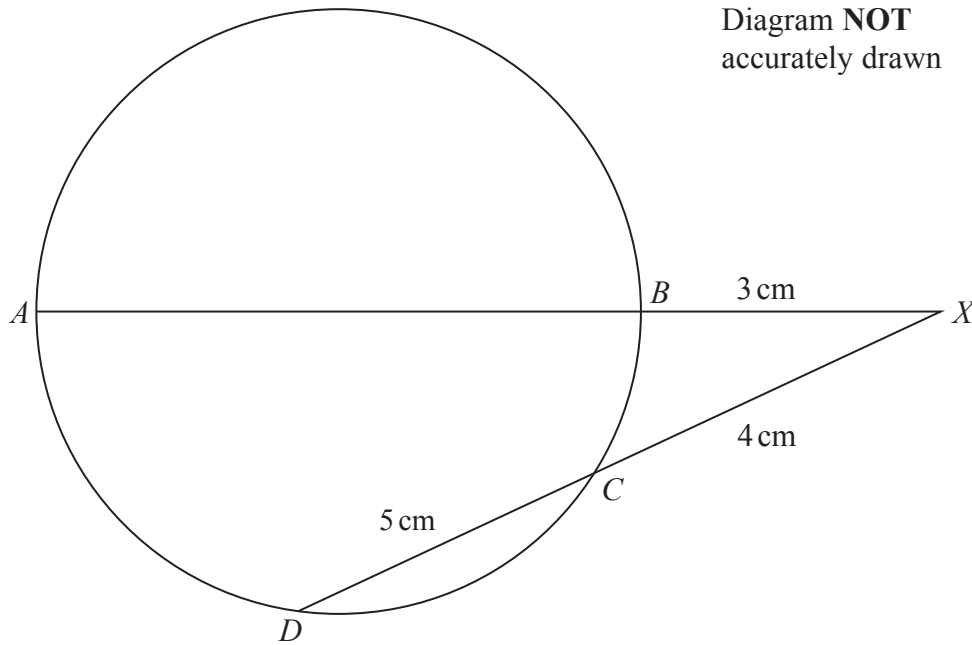
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9

Diagram NOT
accurately drawn



The diagram shows a circle $ABCD$.
The point X is such that ABX and DCX are straight lines.
 $BX = 3$ cm, $DC = 5$ cm and $CX = 4$ cm.

Calculate the length, in cm, of AX .

..... cm

(Total for Question 9 is 2 marks)

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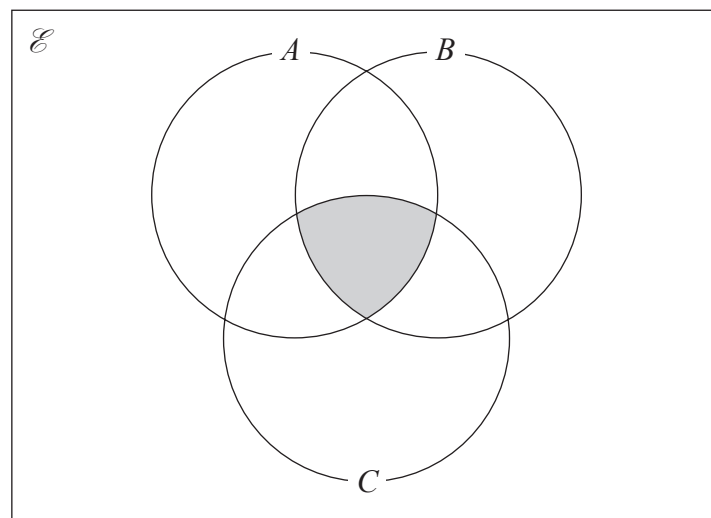
10 The sum of the interior angles of a polygon is 1980°

Calculate the number of sides of this polygon.

(Total for Question 10 is 2 marks)

11 Use set notation to describe the shaded region in each of these Venn diagrams.

(a)



(1)

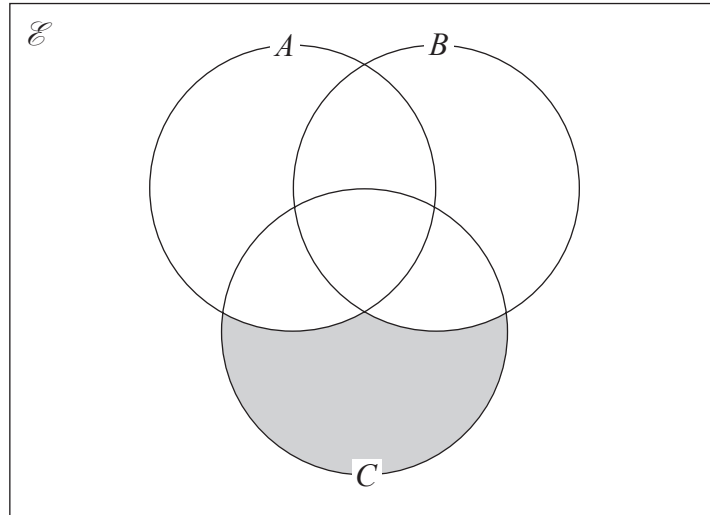


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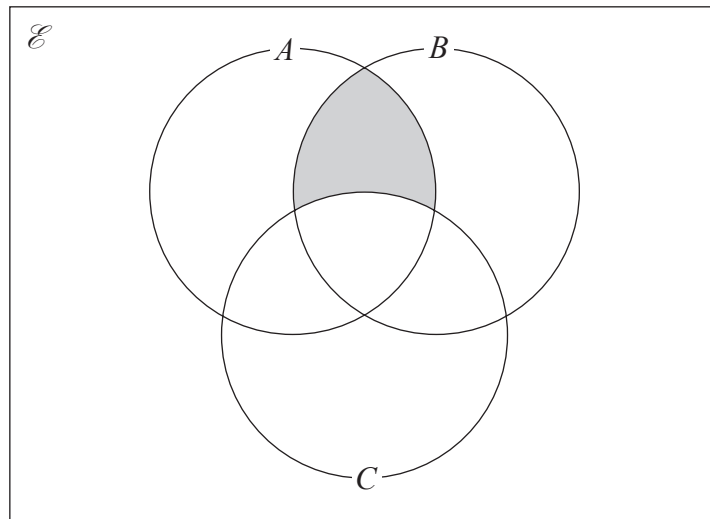
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(b)



(1)

(c)



(1)

(Total for Question 11 is 3 marks)



- 12 The price of potatoes on Monday was £2.20 for 2.5 kg.
The price of potatoes on Friday was £2.10 for 3 kg.

The price per kilogram of the potatoes on Friday was less than the price per kilogram of the potatoes on Monday.

Express the difference in these prices per kilogram as a fraction of the price per kilogram on Monday.

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.....
(Total for Question 12 is 3 marks)



13 Here is a fair spinner labelled 1, 6, 4, 4, 2, 6

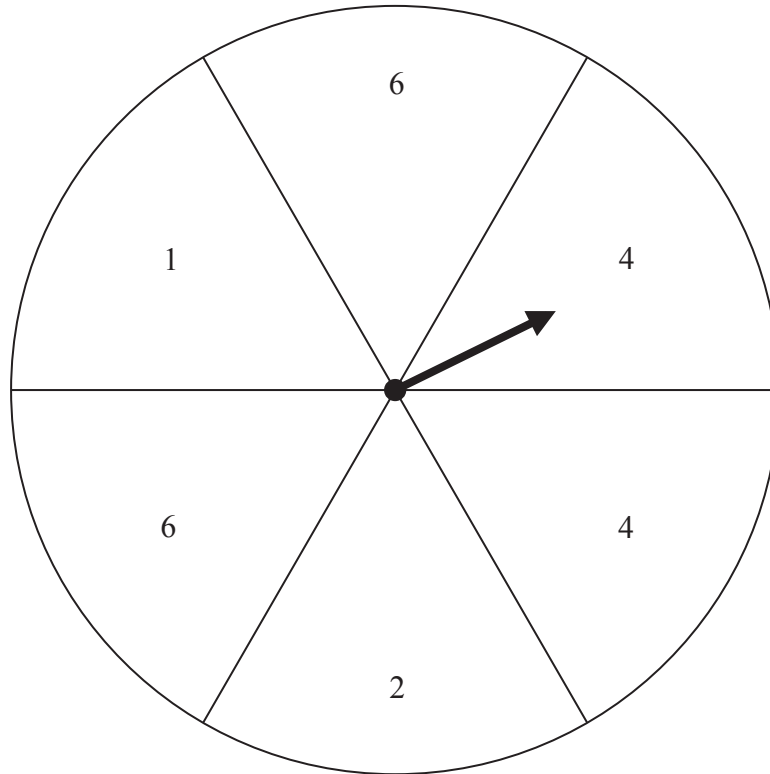


Diagram **NOT** accurately drawn

The spinner is spun twice and the score for each spin is recorded.
The two scores are added together to get the Total.

Calculate the probability that the Total will be 6

(Total for Question 13 is 3 marks)



$$14 \quad \mathcal{E} = \{p, q, r, s, t\}$$

$$A = \{p, r, t\}$$

Two other sets, B and C , each contain four elements.

$$A \cap B = \{p, r\}$$

$$A \cap C = \{p, t\}$$

Set B does not equal set C .

(a) Write down set B .

$$B = \{ \dots\dots\dots \}$$

(1)

(b) Write down set C .

$$C = \{ \dots\dots\dots \}$$

(1)

(c) Write down set $(B \cap C)'$

$$(B \cap C)' = \{ \dots\dots\dots \}$$

(1)

(Total for Question 14 is 3 marks)

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$$15 \quad \mathbf{A} = \begin{pmatrix} 1 & -5 \\ -3 & 7 \end{pmatrix} \quad \mathbf{B} = \begin{pmatrix} 2 & -3 \\ -1 & 6 \end{pmatrix}$$

(a) Find $5\mathbf{A} - 2\mathbf{B}$

.....
(2)

$$\mathbf{C} = \begin{pmatrix} 1 & 2 & -1 \\ 3 & 1 & 3 \end{pmatrix}$$

(b) Find \mathbf{BC}

.....
(2)

(Total for Question 15 is 4 marks)

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$ABCD$ is a rectangle. Showing all your construction lines,

- (a) construct the locus of points inside the rectangle that are equidistant from A and B . (2)

The point P is inside the rectangle and 5.5 cm from both the points A and B .

- (b) Find and mark with a cross (\times) the point P .
Label the point P . (1)

The point M is the midpoint of the side AB of the rectangle.

- (c) Measure and write down the size, in degrees to the nearest degree, of $\angle APM$.

$$\angle APM = \dots\dots\dots^\circ$$

(1)

(Total for Question 16 is 4 marks)



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17 Given that, for all values of x ,

$$(x + 3)(5x + a) = 5x^2 + 21x + b$$

find the value of a and the value of b .

$a = \dots\dots\dots, b = \dots\dots\dots$

(Total for Question 17 is 4 marks)



P 4 6 2 1 1 A 0 1 3 2 4

18

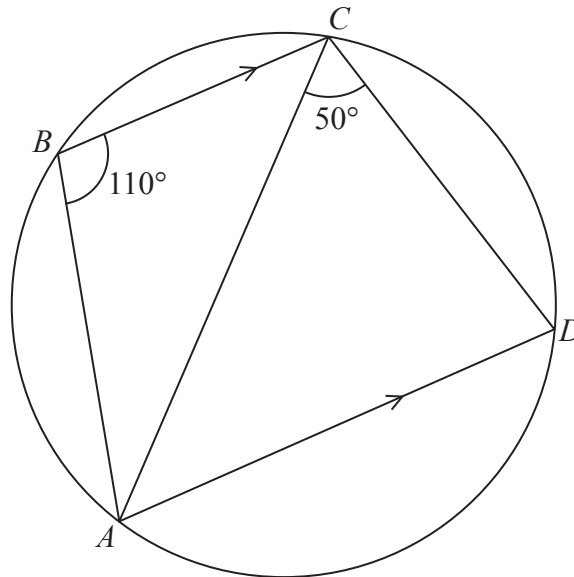


Diagram **NOT** accurately drawn

In the diagram, $ABCD$ is a circle with $\angle ABC = 110^\circ$ and $\angle ACD = 50^\circ$
 BC is parallel to AD .

Calculate, giving your reasons, the size in degrees of $\angle BAC$.

$\angle BAC = \dots\dots\dots^\circ$

(Total for Question 18 is 4 marks)

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19 Solve the simultaneous equations

$$3x - 4y = 5$$

$$2x - y = 5$$

Show clear algebraic working.

.....
(Total for Question 19 is 4 marks)

20 y varies inversely as the cube of x .

Given that $y = 24$ when $x = 2$

find the value of x when $y = -3$

$x =$

(Total for Question 20 is 4 marks)



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21 60 apples are shared between Abha, Banu and Carma in the ratios $1 : 3 : x$, where $x > 3$

(a) Write down an expression, in terms of x , for the number of apples in Carma's share.

.....
(1)

(b) Write down an expression, in terms of x , for the number of apples in Banu's share.

.....
(1)

The number of apples in Carma's share is 18 more than the number of apples in Banu's share.

(c) Find the value of x .

$x =$
(2)

(Total for Question 21 is 4 marks)

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22 The scale of a map is such that 3 cm on the map represents an actual distance of 15.6 km.

(a) Express the scale of the map as a ratio in the form $1 : n$ where n is an integer.

..... (2)

The actual area of a park is 676 km^2

(b) Calculate the area, in cm^2 , of the park on the map.

..... cm^2
(3)

(Total for Question 22 is 5 marks)



23 Solve the equation

$$(2x - 5)(3x + 1) = 4$$

Give your solutions to 3 significant figures.

Show your working clearly.

.....
(Total for Question 23 is 5 marks)

24 $a = 1.2 \times 10^{101}$ and $b = 2 \times 10^{34}$

Showing all your working, calculate, giving your answer in standard form, the value of

(a) ab

.....
(2)

(b) $b^3 - a$

.....
(2)

(c) $\frac{a}{b^3}$

.....
(2)

(Total for Question 24 is 6 marks)

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- 25 A particle P is moving along a straight line. At time t seconds, the displacement, s metres, of P from a fixed point O of the line is given by

$$s = 6t^3 - t^4$$

At time t seconds, the velocity of P is v m/s.

- (a) Find an expression for v in terms of t .

.....
(2)

For $t > 0$, the particle comes to instantaneous rest at the point A .

- (b) Find the distance, in metres to 3 significant figures, of A from O .

..... metres
(4)

(Total for Question 25 is 6 marks)



- 26 A lorry leaves Tower Bridge at 1200 and is driven at a constant speed for 90 km, arriving in Ashford at 1315.

The lorry is parked in Ashford for 15 minutes.

The lorry is then driven at a constant speed to Folkestone.

The lorry arrives in Folkestone at 1400, having been driven a total distance of 120 km.

- (a) Represent, on the grid opposite, the journey of the lorry as a distance-time graph.

Label your graph clearly.

(1)

A car is driven from Folkestone to Tower Bridge through Ashford, along the same roads as the lorry.

The car leaves Folkestone at 1200 and is driven at a constant speed to Tower Bridge, arriving at 1330.

- (b) Represent on the same grid the journey of the car as a distance-time graph.

Label your graph clearly.

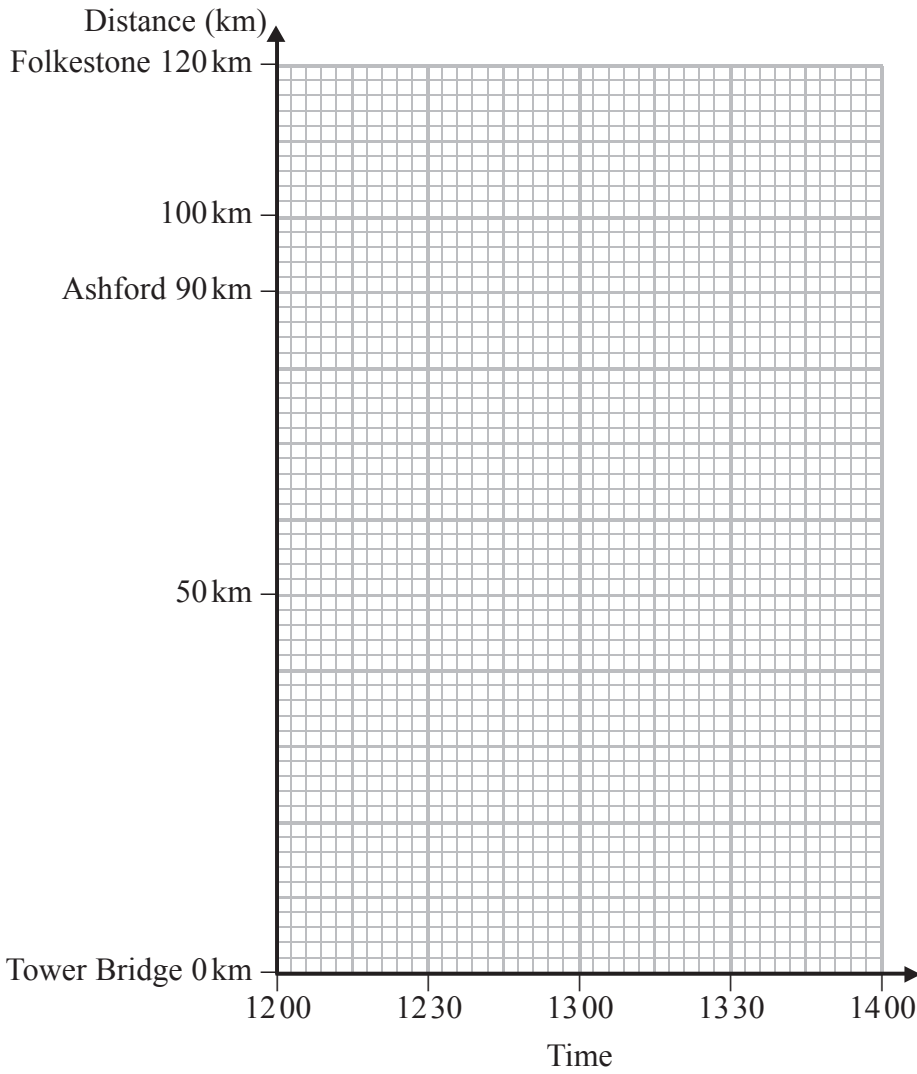
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(c) Calculate the speed, in km/h, of the lorry from Tower Bridge to Ashford.

..... km/h
(2)

(d) Use your graph to write down the distance between the lorry and the car at 1230.

..... km
(1)

(Total for Question 26 is 5 marks)

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27 The table shows information about the circumferences of 41 trees.

Circumference (L cm)	Number of trees
$0 < L \leq 30$	9
$30 < L \leq 40$	8
$40 < L \leq 65$	10
$65 < L \leq 85$	14

(a) Find the class interval that contains the median.

.....
(1)

(b) Calculate an estimate, to the nearest cm, for the mean circumference of the 41 trees.

.....
(3)

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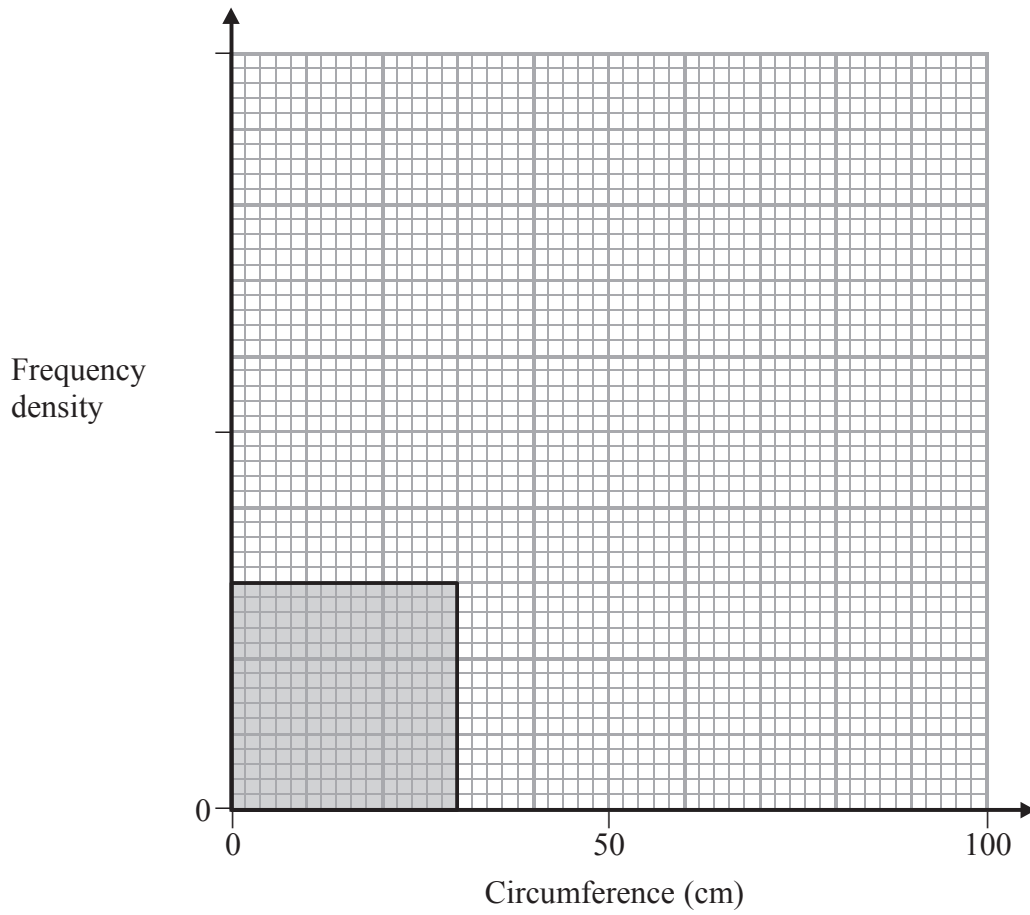
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(c) For the information in the table, complete the histogram.

One bar has been drawn for you.



(3)

(Total for Question 27 is 7 marks)

Turn over for Question 28



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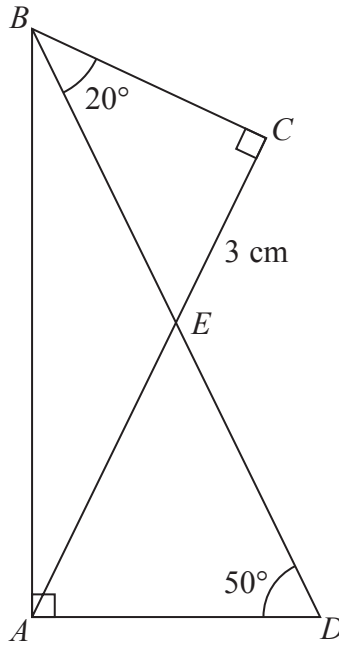


Diagram NOT accurately drawn

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The diagram shows $\triangle ABC$ with $\angle BCA = 90^\circ$ and $\triangle ABD$ with $\angle BAD = 90^\circ$ and $\angle BDA = 50^\circ$. The point E is the intersection of AC and BD .

The diagram also shows $\triangle BCE$ in which $CE = 3 \text{ cm}$ and $\angle CBE = 20^\circ$

Calculate the length, in cm to 3 significant figures, of

(a) BC ,

..... cm
(2)

(b) AD .

..... cm
(4)

(Total for Question 28 is 6 marks)

TOTAL FOR PAPER IS 100 MARKS

