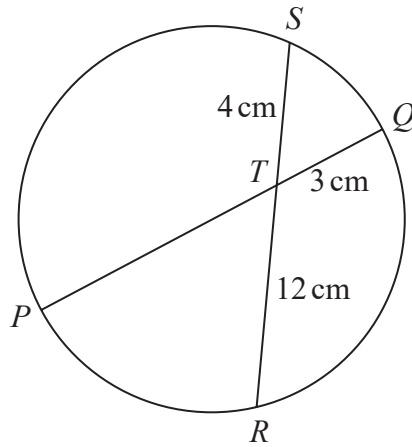


19

Diagram **NOT** accurately drawn



$PTQ$  is a diameter of a circle.  
 $RTS$  is a chord of the circle.

$$TQ = 3 \text{ cm} \qquad ST = 4 \text{ cm} \qquad TR = 12 \text{ cm}$$

Calculate the radius of the circle.

..... cm

(Total for Question 19 is 3 marks)

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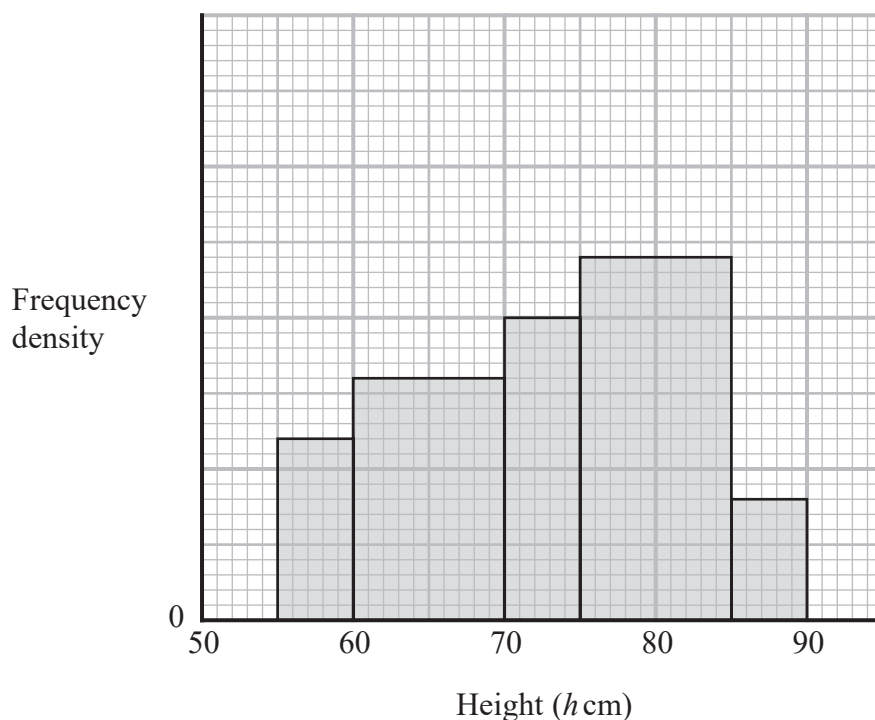
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P 6 9 2 0 3 A 0 2 1 2 8

20 The histogram gives information about the heights,  $h$  cm, of some tomato plants.



There are 12 tomato plants for which  $75 < h \leq 85$

One of the tomato plants is selected at random.

Find an estimate for the probability that this tomato plant has a height greater than 82.5 cm

(Total for Question 20 is 4 marks)

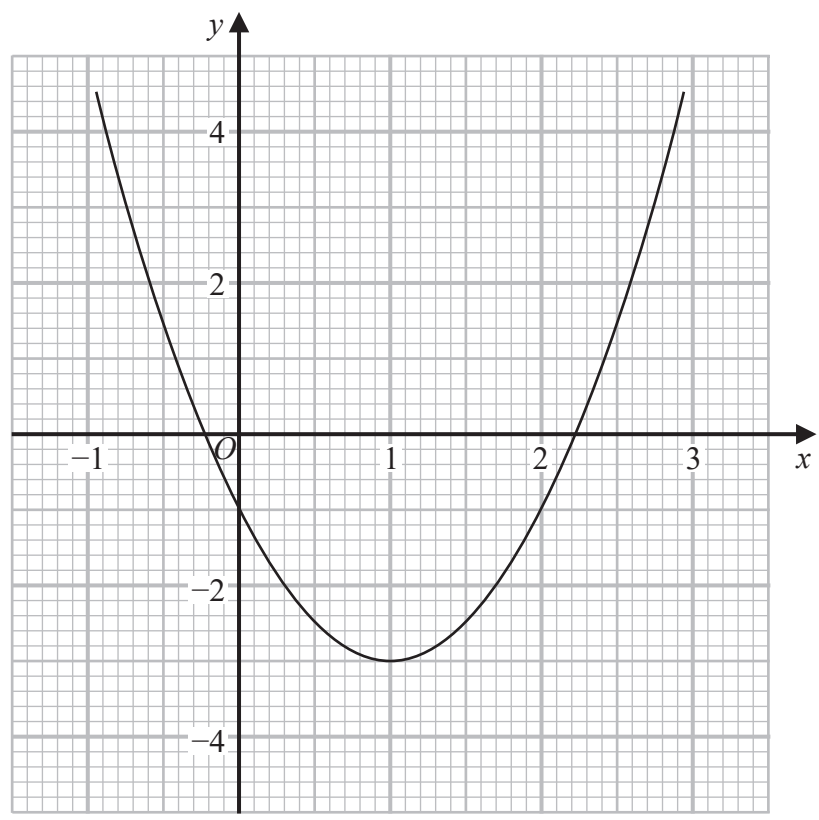


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21 Part of the graph of  $y = 2x^2 - 4x - 1$  is shown on the grid.



(a) Use the graph to find estimates for the solutions of the equation  $2x^2 - 4x - 1 = 0$   
Give your solutions correct to one decimal place.

.....  
(2)

(b) By drawing a suitable straight line on the grid, find estimates for the solutions of the equation  $x^2 - x - 1 = 0$   
Show your working clearly.  
Give your solutions correct to one decimal place.

.....  
(3)

(Total for Question 21 is 5 marks)



22 Here is a rectangle.

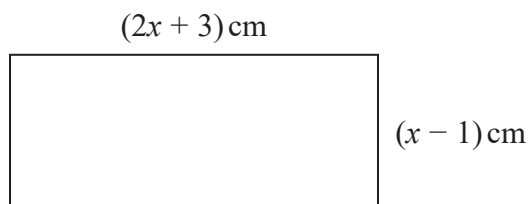


Diagram **NOT** accurately drawn

Given that the area of the rectangle is less than  $75 \text{ cm}^2$

find the range of possible values of  $x$

.....  
(Total for Question 22 is 5 marks)

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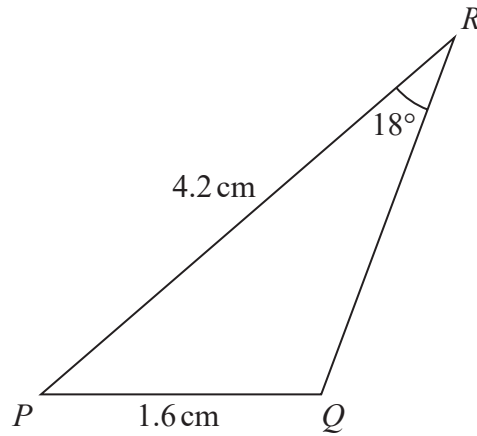
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23 The diagram shows triangle  $PQR$

Diagram **NOT** accurately drawn



$PQ = 1.6 \text{ cm}$        $PR = 4.2 \text{ cm}$       Angle  $PRQ = 18^\circ$

Given that angle  $PQR$  is obtuse,

work out the area of triangle  $PQR$

Give your answer correct to 3 significant figures.

.....  $\text{cm}^2$

(Total for Question 23 is 6 marks)



P 6 9 2 0 3 A 0 2 5 2 8

24 A particle  $P$  moves along a straight line that passes through the fixed point  $O$

The displacement,  $x$  metres, of  $P$  from  $O$  at time  $t$  seconds, where  $t \geq 0$ , is given by

$$x = 4t^3 - 27t + 8$$

The direction of motion of  $P$  reverses when  $P$  is at the point  $A$  on the line.

The acceleration of  $P$  at the instant when  $P$  is at  $A$  is  $a \text{ m/s}^2$

Find the value of  $a$

$a = \dots\dots\dots$

(Total for Question 24 is 5 marks)





- 26 An arithmetic series has first term  $a$  and common difference  $d$ , where  $d$  is a prime number.

The sum of the first  $n$  terms of the series is  $S_n$  and

$$S_m = 39$$

$$S_{2m} = 320$$

Find the value of  $d$  and the value of  $m$   
Show clear algebraic working.

$$d = \dots\dots\dots$$

$$m = \dots\dots\dots$$

(Total for Question 26 is 5 marks)

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**TOTAL FOR PAPER IS 100 MARKS**

