Gold Level

Question Paper 15

Level	IGCSE
Subject	Maths
Exam Board	Edexcel
Difficulty Level	Gold
Booklet	Question Paper 15

Time Allowed: **56 minutes**

Score: **/46**

Percentage: **/100**

Grade Boundaries:

9	8	7	6	5	4	3	2	1
>85%	75%	65%	55%	45%	35%	25%	15%	<15%

1

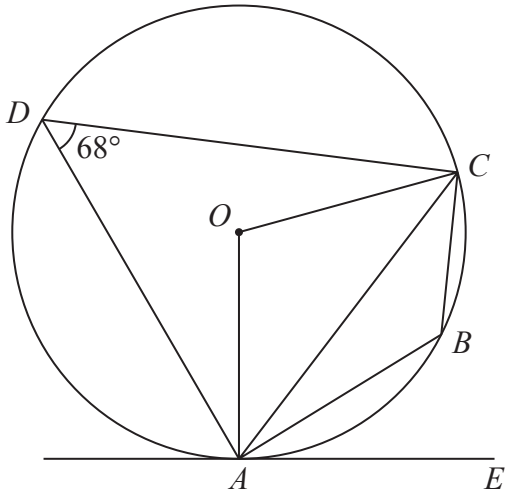


Diagram **NOT** accurately drawn

A, *B*, *C* and *D* are points on a circle, centre *O*.
AE is a tangent to the circle.
Angle *ADC* = 68°

(a) (i) Find the size of angle *ABC*.

.....°

(ii) Give a reason for your answer.

.....

(2)

(b) (i) Find the size of angle *AOC*.

.....°

(ii) Give a reason for your answer.

.....

(2)

(c) Find the size of angle *CAE*.

.....°

(1)

(Total for Question 1 is 5 marks)

2 For the curve with equation $y = 4x^3 - 2x + 5$

(i) find $\frac{dy}{dx}$

.....

(ii) find the coordinates of the two points on the curve where the gradient of the curve is 1

(..... , ...) and (..... , ...)

(Total for Question 2 is 6 marks)

3 A particle moves from rest.
The speed of the particle is v m/s when it has moved a distance of x metres.

v is proportional to $\sqrt{x}$

When $v = 8$, $x = 25$

(a) Express v in terms of x.

.....

(3)

(b) Find the speed of the object when it has moved a distance of 56.25 metres.

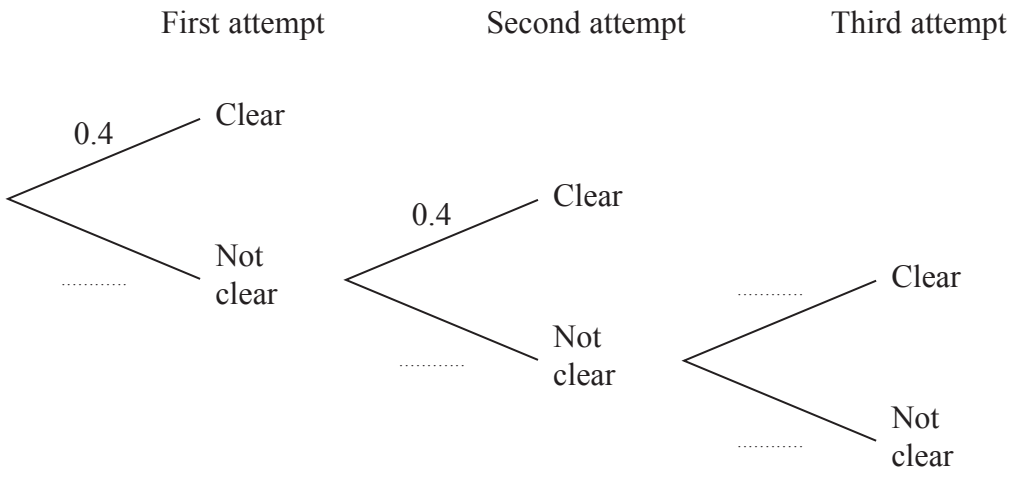
..... m/s

(2)

(Total for Question 3 is 5 marks)

4 Hugo competes in the high jump at a school athletics competition.
He has up to 3 attempts to clear the bar at each height.
When he clears the bar, he does not have another attempt at that height.

When the bar is set at a height of 1.60 metres, the probability that Hugo will clear the bar on any attempt is 0.4
The probability tree diagram shows the possible outcomes of Hugo's attempts at 1.60 metres.



(a) Complete the probability tree diagram to show the four missing probabilities.

(1)

(b) Work out the probability that Hugo does not clear the bar on his first two attempts and then does clear the bar on his third attempt at 1.60 metres.

.....

(2)

Hugo clears the bar at 1.60 metres and the height is raised to 1.65 metres.
He has up to three attempts to clear the bar at 1.65 metres.

When the bar is set at a height of 1.65 metres, the probability that Hugo will clear the bar on any attempt is 0.3

(c) Find the probability that Hugo clears the bar at 1.65 metres.

.....

(3)

(Total for Question 4 is 6 marks)

5

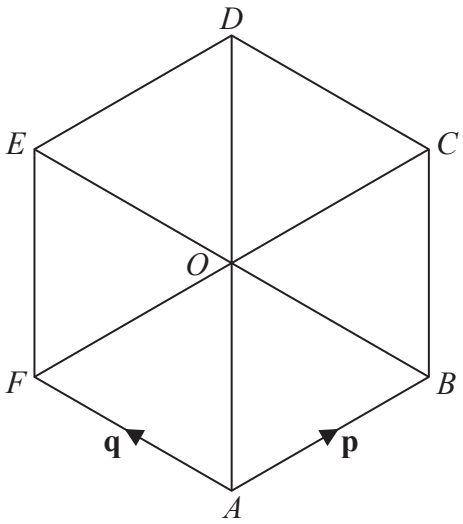


Diagram **NOT** accurately drawn

ABCDEF is a regular hexagon, centre *O*.

$\overrightarrow{AB}$ = **p** and $\overrightarrow{AF}$ = **q**

(a) Express in terms of **p** and **q**

(i) $\overrightarrow{AO}$

.....

(ii) $\overrightarrow{AD}$

.....

(iii) $\overrightarrow{AC}$

.....

(3)

(b) Given that **p** = $\begin{pmatrix} \sqrt{3} \\ 1 \end{pmatrix}$ centimetres,

find the length of a side of the hexagon.

..... cm

(2)

(Total for Question 5 is 5 marks)

6

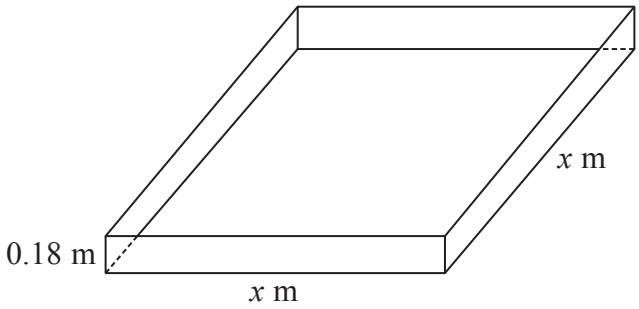


Diagram **NOT** accurately drawn

Trena wants to build a sandpit in the shape of a cuboid.
The volume of sand in the sandpit will be 1.0 m^3, correct to 1 decimal place.
The depth of sand in the sandpit will be 0.18 metres, correct to 2 decimal places.
The sandpit will have a square base with sides of length x metres.

Find the upper bound for x
Give your answer correct to 3 significant figures.

upper bound = ...

(Total for Question 6 is 4 marks)

7 Express $\frac{4}{x-1} - \frac{3}{x+1}$ as a single fraction.

Give your answer as simply as possible.

.....

(Total for Question 7 is 3 marks)

8

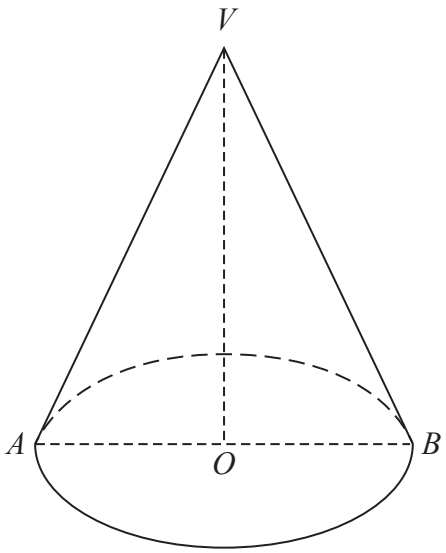


Diagram **NOT** accurately drawn

The diagram shows a solid cone.
The base of the cone is a horizontal circle, centre O, with radius 4.5 cm.
AB is a diameter of the base and OV is the vertical height of the cone.
The curved surface area of the cone is 130 cm^2

Calculate the size of the angle AVB.

Give your answer correct to 1 decimal place.

.....°

(Total for Question 8 is 4 marks)

9 The table gives information about the speed, in km/h, of 180 vehicles passing a speed checkpoint.

Speed (v km/h)	**Frequency**
$40 < v \leqslant 50$	4
$50 < v \leqslant 60$	52
$60 < v \leqslant 70$	60
$70 < v \leqslant 80$	34
$80 < v \leqslant 90$	18
$90 < v \leqslant 100$	12

(a) Write down the modal class.

.....

(1)

(b) Work out an estimate for the probability that the next vehicle passing the speed checkpoint will have a speed of 60 km/h or less.

.....

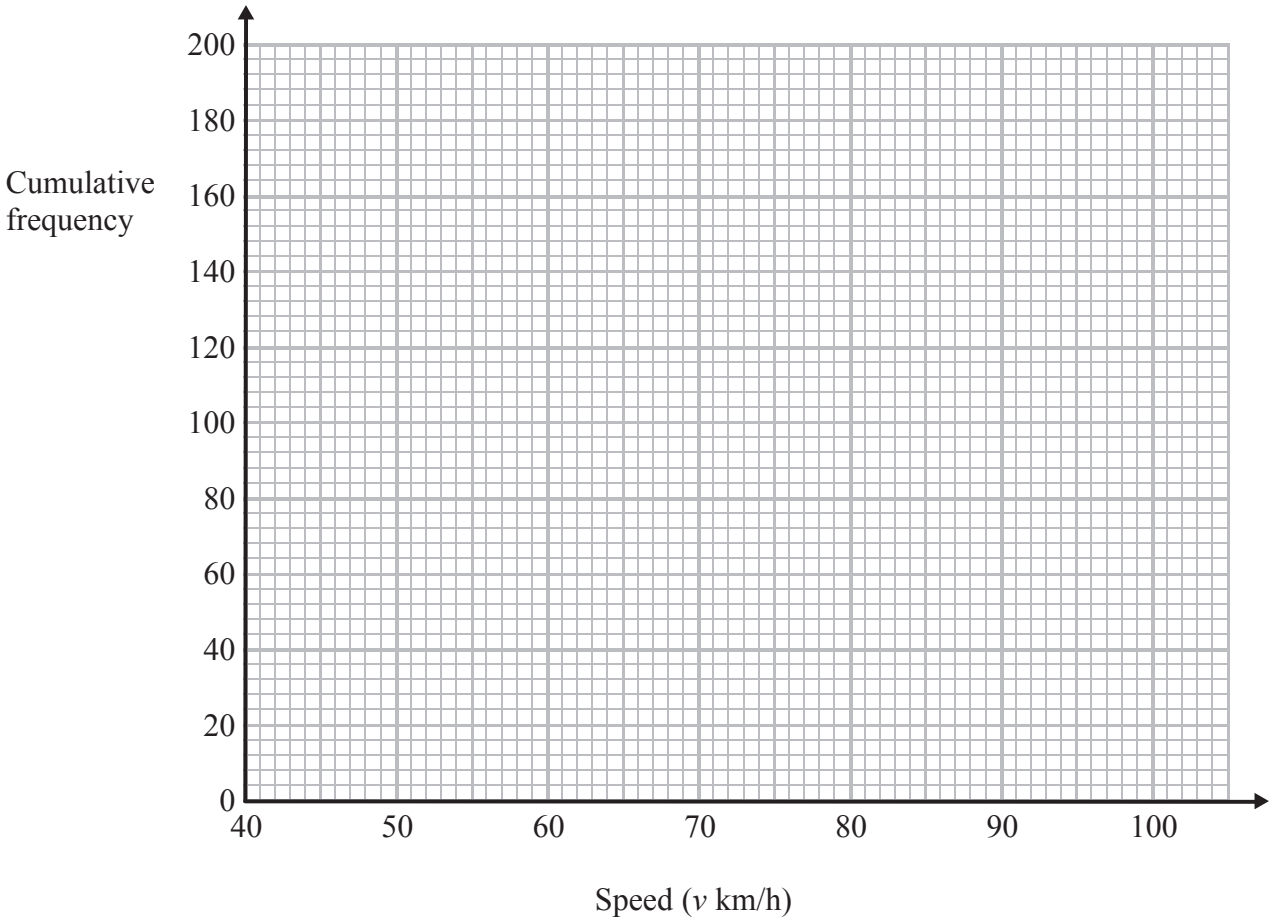
(2)

(c) Complete the cumulative frequency table.

Speed (v km/h)	**Cumulative frequency**
$40 < v \leqslant 50$	
$40 < v \leqslant 60$	
$40 < v \leqslant 70$	
$40 < v \leqslant 80$	
$40 < v \leqslant 90$	
$40 < v \leqslant 100$	

(1)

(d) On the grid, draw a cumulative frequency graph for your table.



(2)

(e) The police decide to fine the driver of any vehicle passing the speed checkpoint at a speed of more than 84 km/h.
Use your graph to find an estimate for the number of drivers the police decide to fine.
Show your method clearly.

.....

(2)

(Total for Question 9 is 8 marks)