Gold Level

Question Paper 22

Level	IGCSE
Subject	Maths
Exam Board	Edexcel
Difficulty Level	Gold
Booklet	Question Paper 22

Time Allowed: **59 minutes**

Score: **/49**

Percentage: **/100**

Grade Boundaries:

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

1 $\mathbf{a} = \begin{pmatrix} 5 \\ -2 \end{pmatrix}$ $\mathbf{b} = \begin{pmatrix} 1 \\ 7 \end{pmatrix}$ $\mathbf{c} = \begin{pmatrix} -7 \\ 0 \end{pmatrix}$

(a) Write, as a column vector, $2\mathbf{a}$

( )

.....

(1)

(b) Write, as a column vector, $3\mathbf{b} - \mathbf{c}$

( )

.....

(2)

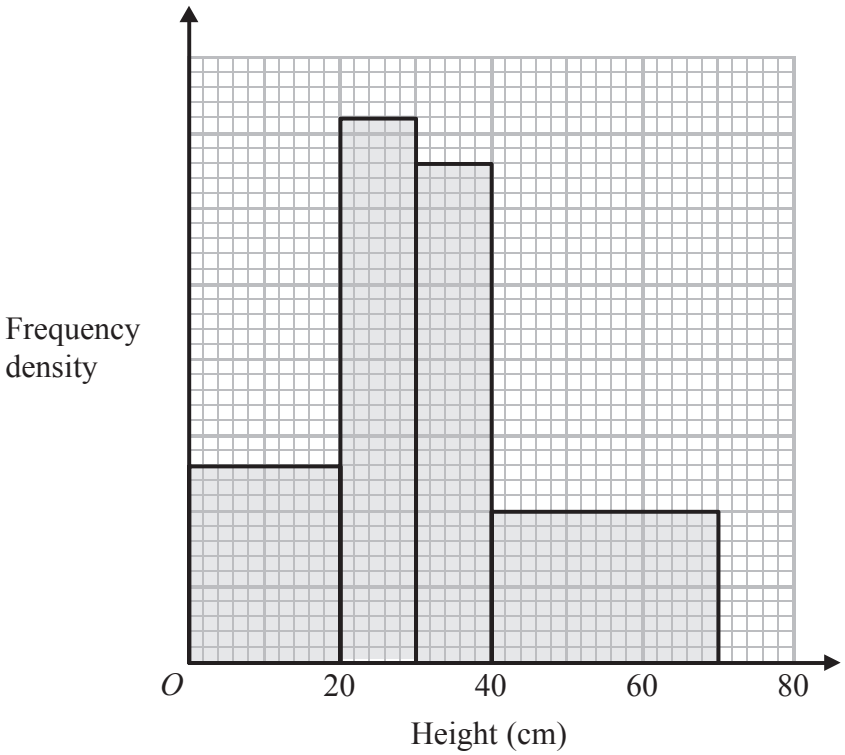
(c) Work out the magnitude of $\mathbf{a}$
Give your answer as a surd.

.....

(2)

(Total for Question 1 is 5 marks)

2 The histogram shows information about the heights of some tomato plants.



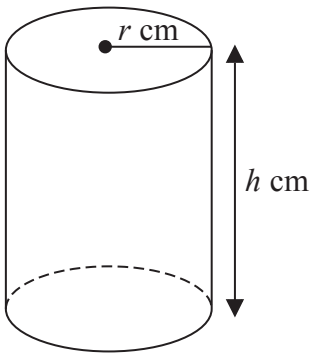
26 plants have a height of less than 20 cm.

Work out the total number of tomato plants.

.....

(Total for Question 2 is 3 marks)

3 The diagram shows a cylinder and a sphere.



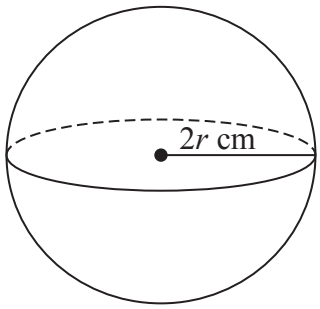


Diagram **NOT** accurately drawn

The cylinder has radius r cm and height h cm.
The sphere has radius $2r$ cm.

The volume of the cylinder is equal to the volume of the sphere.
Find an expression for h in terms of r.
Give your answer in its simplest form.

.....

(Total for Question 3 is 3 marks)

4 (a) Write $\frac{1}{32}$ as a power of 2

.....

(2)

(b) Show that $(4 + \sqrt{12})(5 - \sqrt{3}) = 14 + 6\sqrt{3}$
Show each stage of your working clearly.

(3)

(Total for Question 4 is 5 marks)

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5 Write $5 - (x + 2) \div \left(\frac{x^2 - 4}{x - 3} \right)$ as a single fraction.

Simplify your answer fully.

.....

(Total for Question 5 is 4 marks)

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6 The diagram shows a sector $OAPB$ of a circle, centre O.

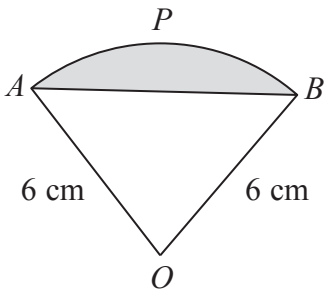


Diagram **NOT** accurately drawn

AB is a chord of the circle.
$OA = OB = 6$ cm.

The area of sector $OAPB$ is 5π cm^2

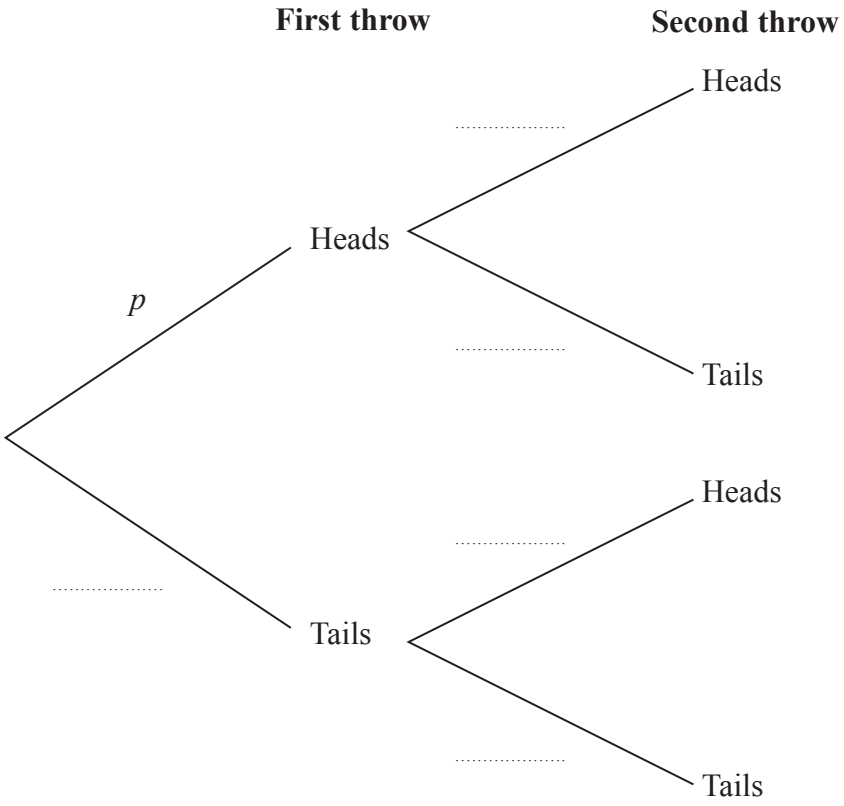
Calculate the perimeter of the shaded segment.
Give your answer correct to 3 significant figures.

..... cm

(Total for Question 6 is 6 marks)

7 Jim has a biased coin.
The probability that Jim will throw Heads on any throw is p.
Jim throws the coin twice.

(a) Complete the probability tree diagram.
Give your probabilities in terms of p.



(2)

(b) Find an expression, in terms of p, for the probability that Jim will throw two Heads.

.....

(1)

Given that $p = 0.8$,

(c) work out the probability that Jim will throw exactly one Head.

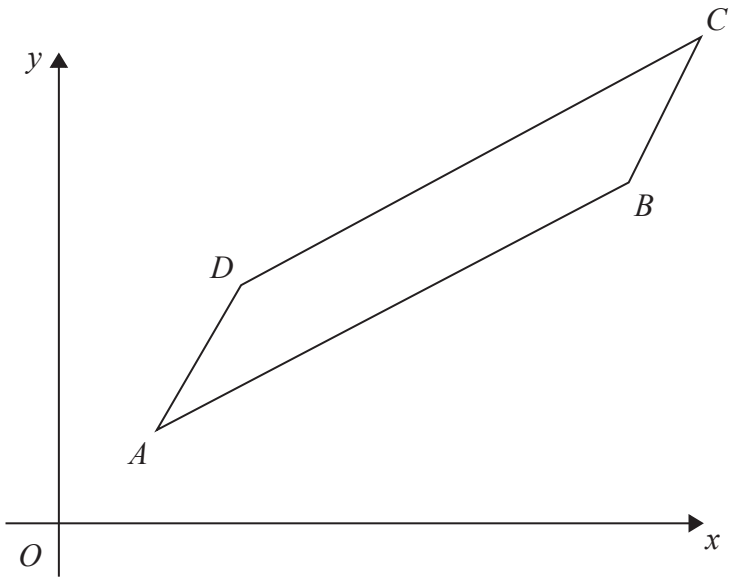
.....

(3)

(Total for Question 7 is 6 marks)

8 Here is the parallelogram $ABCD$.

Diagram **NOT** accurately drawn



$\overrightarrow{AD} = \begin{pmatrix} 1 \\ 2 \end{pmatrix}$, $\overrightarrow{AB} = \begin{pmatrix} 5 \\ 3 \end{pmatrix}$

(a) Find the magnitude of $\overrightarrow{AD}$.

Give your answer correct to 3 significant figures.

.....

(2)

The point A has coordinates (4, 2)

(b) Work out the coordinates of the point C.

.....

(3)

The diagonals of the parallelogram $ABCD$ cross at the point E.

(c) Find as a column vector, $\overrightarrow{OE}$.

.....

(3)

(Total for Question 8 is 8 marks)

9

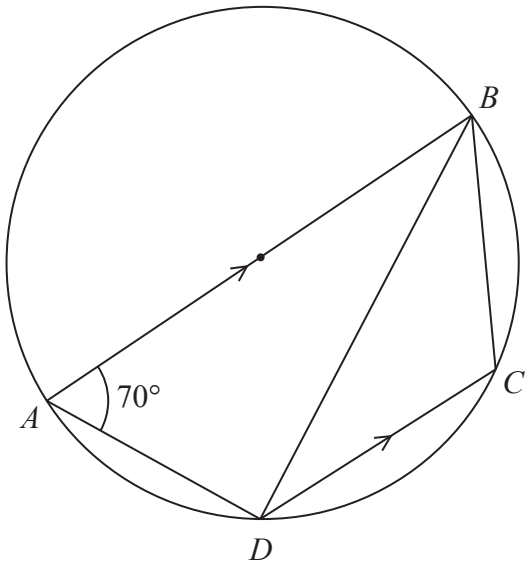


Diagram **NOT** accurately drawn

A, *B*, *C* and *D* are points on a circle.
AB is a diameter of the circle.
DC is parallel to *AB*.
Angle *BAD* = 70°

(a) Calculate the size of angle *BDC*.

.....°

(2)

The tangent to the circle at *D* meets the line *BC* extended at *T*.

(b) Calculate the size of angle *BTD*.

.....°

(3)

(Total for Question 9 is 5 marks)

10 (a) Show that $(3 + 2\sqrt{2})(4 - \sqrt{2}) = 8 + 5\sqrt{2}$

Show your working clearly.

(2)

(b) Rationalise the denominator and simplify fully $\dfrac{10 + 3\sqrt{2}}{\sqrt{2}}$

Show your working clearly.

.....

(2)

(Total for Question 10 is 4 marks)