

GCSE Exam Questions

Sine, Cosine and Tangent Graphs | Geometry & Measure



GCSE Exam Questions: Sine, Cosine and Tangent Graphs

1) Here is a sketch of the graph of $y = \cos(\theta)$ for values of θ from 0° to 360°



(a) $\cos(\theta) = \cos(315)$

Work out the value of θ when $0 \le \theta \le 180^{\circ}$

(2)

(b) $\cos(\theta) = \cos(315)$

Work out the value of θ when $540 \le \theta \le 720^{\circ}$

(2)

(4 marks)



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2) Here is a sketch of the graph of $y = \tan(\theta)$ for values of θ from -360° to 360°.

(a) Using the graph of $tan(\theta)$, write down the two solutions to the equation $tan(\theta) = 2.5$ for $-360 \le \theta \le 0$.

(3)

(b) Estimate the value of θ for $-90 \le \theta \le 0$ when $\tan(\theta) = -3$

(2) (5 marks)



GCSE Exam Questions: Topic

3) Here are the graphs of $y = \cos(\theta)$ and $y = \sin(\theta)$ for values of from 0° to 360°.



(a) Write the solutions of θ when $\sin(\theta) = \cos(\theta)$ for $0 \le \theta \le 360^\circ$

(b) Kim says:

The graphs of the sine, cosine and tangent functions all intersect at the same point for $0 \le \theta \le 90^{\circ}$

By using exact trigonometric values, show that Kim is not correct.

(3) (5 marks)

(1)



GCSE Exam Questions: Sine, Cosine and Tangent Graph Answers

	Question	Answer	Marks
1)	Here is a sketch of the graph of $y = \cos(\theta)$ for values of θ from 0 to 360°.		
(a)	$cos(\theta) = cos(315)$ Work out the value of θ when $0 \le \theta \le 180^{\circ}$	Vertical line drawn at $cos(315) \approx 0.7$. $\theta = 45^{\circ}$	(1) (1)
(b)	$cos(\theta) = cos(315)$ Work out the value of θ when $540 \le \theta \le 720^\circ$.	$315^{\circ} + 360^{\circ}$ = 675°	(1) (1)
2)	Here is a sketch of the graph of $y = \tan(\theta)$ for values of θ from -360° to 360°.		
(a)	Using the graph of $tan(\theta)$, write down the two solutions to the equation $tan(\theta) = 2.5$ for $-360 \le \theta \le 0$.	Horizontal line drawn at $tan(\theta) = 2.5$. [- 115, - 105] (exact value = - 111°) [- 295, - 285] (exact value = - 292°)	(1) (1) (1)
(b)	Estimate the value of θ for $-90 \le \theta \le 0$ when $\tan(\theta) = -3$.	When $\tan(\theta) = 3$, $\theta = 72^{\circ} [65^{\circ}, 80^{\circ}]$ $\theta = -72^{\circ} [-80^{\circ}, -65^{\circ}]$	(1) (1)



GCSE Exam Questions: Sine, Cosine and Tangent Graph Answers

	Question	Answer	Marks
3)	Here are the graphs of $y = cos(\theta)$ and $y = sin(\theta)$		
(a)	y y y y y y y y y θ y θ y θ y θ y θ y θ	$ heta = 45^{\circ}$ $ heta = 225^{\circ}$	(1) (1)
(b)	Kim says "the graphs of the sine, cosine and tangent functions all intersect at the same point for $0 \le \theta \le 90^{\circ}$ ". By using exact trigonometric values, show that Kim is not correct.	$\sin(45) = \cos(45) = \frac{\sqrt{2}}{2}$ $\tan(45) = 1$ $\tan(45) \neq \frac{\sqrt{2}}{2}$ so not equal to $\sin(45)$ or $\cos(45)$ which is the only point of intersection of $\sin(\theta)$ and $\cos(\theta)$ for $0^\circ \le \theta \le 90^\circ$ oe	(1) (1) (1)

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