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Pure Mathematics-1

TOPIC- Trigonometry

Curves/Sketches

TRIGONOMETRY-CURVES/Sketches

- 7-9-11
1
- 1 Solve the equation $3 \tan(2x + 15^\circ) = 4$ for $0^\circ \leq x \leq 180^\circ$. [4]
- 7-9-11
2
- 2 The equation of a curve is $y = 3 \cos 2x$. The equation of a line is $x + 2y = \pi$. On the same diagram, sketch the curve and the line for $0 \leq x \leq \pi$. [4]



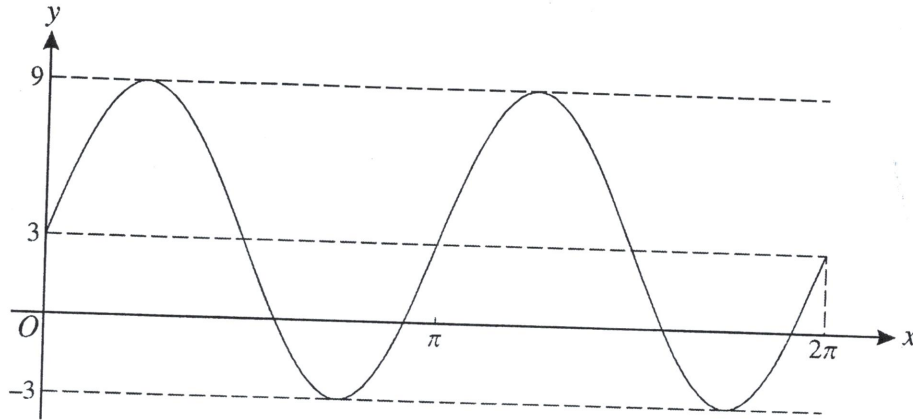
TRIGONOMETRY-CURVES/Sketches

- 03
7-11-12
5
- (i) Sketch, on the same diagram, the graphs of $y = \sin x$ and $y = \cos 2x$ for $0^\circ \leq x \leq 180^\circ$. [3]
- (ii) Verify that $x = 30^\circ$ is a root of the equation $\sin x = \cos 2x$, and state the other root of this equation for which $0^\circ \leq x \leq 180^\circ$. [2]
- (iii) Hence state the set of values of x , for $0^\circ \leq x \leq 180^\circ$, for which $\sin x < \cos 2x$. [2]



TRIGONOMETRY-CURVES/Sketches

4



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The diagram shows the graph of $y = a \sin(bx) + c$ for $0 \leq x \leq 2\pi$.

- (i) Find the values of a , b and c . [3]
- (ii) Find the smallest value of x in the interval $0 \leq x \leq 2\pi$ for which $y = 0$. [3]

TRIGONOMETRY

5 The equation of a curve is $y = 2 \cos x$.

- (i) Sketch the graph of $y = 2 \cos x$ for $-\pi \leq x \leq \pi$, stating the coordinates of the point of intersection with the y -axis. [2]

Q-17-16 TR0

Points P and Q lie on the curve and have x -coordinates of $\frac{1}{3}\pi$ and π respectively.

- (ii) Find the length of PQ correct to 1 decimal place. [2]

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TRIGONOMETRY

The line through P and Q meets the x -axis at $H(h, 0)$ and the y -axis at $K(0, k)$.

(iii) Show that $h = \frac{5}{9}\pi$ and find the value of k .

[3]

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9-17-11-7 (5)



TRIGONOMETRY-CURVES/Sketches

- 7-4-3
④
- 06 (i) Sketch and label, on the same diagram, the graphs of $y = 2 \sin x$ and $y = \cos 2x$, for the interval $0 \leq x \leq \pi$. [4]
- (ii) Hence state the number of solutions of the equation $2 \sin x = \cos 2x$ in the interval $0 \leq x \leq \pi$. [1]



TRIGONOMETRY-CURVES/Sketches

07 (i) Sketch, on a single diagram, the graphs of $y = \cos 2\theta$ and $y = \frac{1}{2}$ for $0 \leq \theta \leq 2\pi$. [3]

2-11-11
9 (ii) Write down the number of roots of the equation $2 \cos 2\theta - 1 = 0$ in the interval $0 \leq \theta \leq 2\pi$. [1]

(iii) Deduce the number of roots of the equation $2 \cos 2\theta - 1 = 0$ in the interval $10\pi \leq \theta \leq 20\pi$. [1]



TRIGONOMETRY-CURVES/Sketches

- 08 (i) Sketch, on the same diagram, the curves $y = \sin 2x$ and $y = \cos x - 1$ for $0 \leq x \leq 2\pi$. [4]
- (ii) Hence state the number of solutions, in the interval $0 \leq x \leq 2\pi$, of the equations
- (A) $2 \sin 2x + 1 = 0$, [1]
- (B) $\sin 2x - \cos x + 1 = 0$. [1]

