

5 (a) Show that $\tan^4 \theta - 1 \equiv \frac{1 - 2 \cos^2 \theta}{\cos^4 \theta}$. [3]

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(b) Hence solve the equation $\cos^2 \theta (\tan^4 \theta - 1) = 7$ for $0^\circ < \theta < 180^\circ$. [4]

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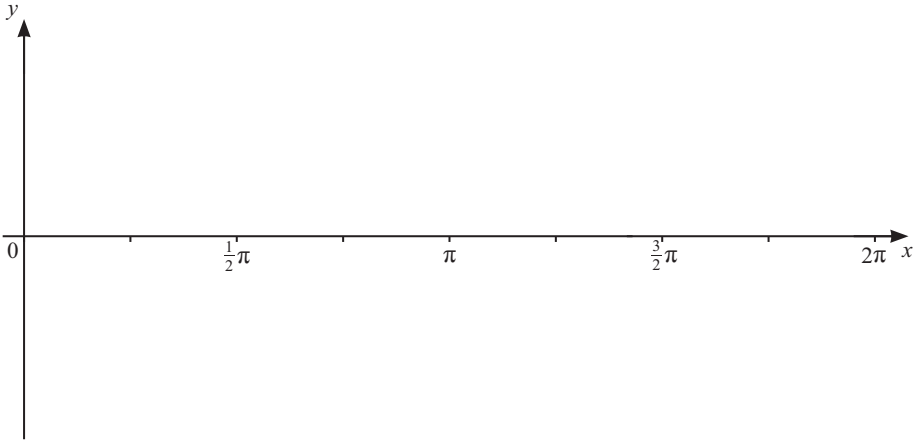
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6 (a) Sketch the graph of $y = 3 \sin x + 2$ for $0 \leq x \leq 2\pi$. [2]



(b) Determine the number of solutions in the interval $0 \leq x \leq 2\pi$ of each of the following equations.

(i) $3 \sin x + 2 = x$ [1]

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(ii) $3 \sin x + 2 = 5 - x$ [1]

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(c) Solve the equation $3 \sin x + 2 = 5 \cos^2 x - 1$ for $0 \leq x \leq 2\pi$.

[5]

1 Solve the equation $6 \sin \theta = 1 + \frac{2}{\sin \theta}$ for $-180^\circ < \theta < 180^\circ$.

[4]

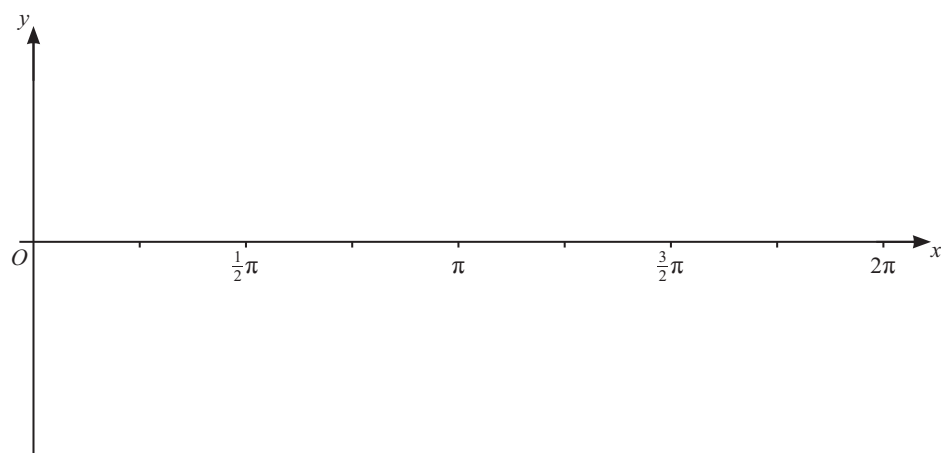
5 The equation of a curve is $y = 4 \cos 2x + 3$ for $0 \leq x \leq 2\pi$.

- (a) State the greatest and least possible values of y .

[2]

- (b) Sketch the curve.

[2]



- (c) Hence determine the number of solutions of the equation $4 \cos 2x + 3 = 2x - 1$ for $0 \leq x \leq 2\pi$. [1]

⑤

- 7 (a) Prove the identity $\frac{\tan \theta + 1}{\tan^2 \theta - 3} \equiv \frac{\sin \theta \cos \theta + 1}{1 - 4 \cos^2 \theta}$.

[3]

⑥

[4]

[illegible]