

P2 CHAPTER QUIZ - Trigonometry

Questions

Q1.

Solve, for $0 < \theta < \frac{\pi}{2}$, $5 \sin 3\theta - 7 \cos 3\theta = 0$.

Give each solution, in radians, to 3 significant figures.

(Total for question = 5 marks)

Q2.

In this question the angle θ is measured in degrees throughout.

(a) Show that the equation

$$\frac{5 + \sin \theta}{3 \cos \theta} = 2 \cos \theta, \quad \theta \neq (2n + 1)90^\circ, n \in \mathbb{Z}$$

may be rewritten as

$$6 \sin^2 \theta + \sin \theta - 1 = 0$$

(3)

(b) Explain why $\theta \neq (2n + 1)90^\circ, n \in \mathbb{Z}$ is given along with the equation as a constraint.

(2)

(Total for question = 5 marks)

Q3.

(a) Given that $7 \sin x = 3 \cos x$, find the exact value of $\tan x$.

(1)

(b) Hence solve for $0 \leq \theta \leq 360^\circ$

$$7 \sin(2\theta + 30^\circ) = 3 \cos(2\theta + 30^\circ)$$

giving your answers to one decimal place.

(Solutions based entirely on graphical or numerical methods are not acceptable.)

(5)

(Total for question = 6 marks)

Q4.

(a) Show that
$$\frac{10 \sin^2 \theta - 7 \cos \theta + 2}{3 + 2 \cos \theta} \equiv 4 - 5 \cos \theta$$

(4)

(b) Hence, or otherwise, solve, for $0 \leq x \leq 360^\circ$, the equation

$$\frac{10 \sin^2 x - 7 \cos x + 2}{3 + 2 \cos x} = 4 + 3 \sin x$$

(3)

(Total for question = 7 marks)