

Year 1 Pure Chapter 10 - Trigonometric Identities Exam Questions (Total Marks 46)

1. Solve, for $0 \leq x < 360^\circ$,

(a) $\sin(x - 20^\circ) = \frac{1}{\sqrt{2}}$

(4)

(b) $\cos 3x = -\frac{1}{2}$

(6)

(Total 10 marks)

2. (a) Given that $5\sin\theta = 2\cos\theta$, find the value of $\tan\theta$.

(1)

- (b) Solve, for $0 \leq x < 360^\circ$,

$$5\sin 2x = 2\cos 2x,$$

giving your answers to 1 decimal place.

(5)

(Total 6 marks)

3. Find all the solutions, in the interval $0 \leq x < 360$, of the equation

$$2 \cos^2 x + 1 = 5 \sin x$$

(Total 6 marks)

4. (a) Show that the equation

$$5 \sin x = 1 + 2 \cos^2 x$$

can be written in the form

$$2 \sin^2 x + 5 \sin x - 3 = 0$$

(2)

- (b) Solve, for $0 \leq x < 360^\circ$,

$$2 \sin^2 x + 5 \sin x - 3 = 0$$

(4)

(Total 6 marks)

5. (a) Show that the equation

$$4 \sin^2 x + 9 \cos x - 6 = 0$$

can be written as

$$4 \cos^2 x - 9 \cos x + 2 = 0.$$

(2)

- (b) Hence solve, for $0 \leq x < 720^\circ$,

$$4 \sin^2 x + 9 \cos x - 6 = 0,$$

giving your answers to 1 decimal place.

(6)

(Total 8 marks)

6. (i) Solve, for $-180^\circ \leq \theta < 180^\circ$,

$$(1 + \tan \theta)(5 \sin \theta - 2) = 0.$$

(4)

- (ii) Solve, for $0 \leq x < 360^\circ$,

$$4 \sin x = 3 \tan x.$$

(6)

(Total 10 marks)