Year 2 Pure Chapter 6: Trigonometry Functions - Exam Questions (Total Marks 41)

1. (a) Prove that

$$\sec^2 x - \operatorname{cosec}^2 x \equiv \tan^2 x - \cot^2 x.$$

(3)

(b) Solve, for $0 < \theta < 180°$, the equation

$$2\cot^2\theta = 7\operatorname{cosec}\theta - 8,$$

giving your answers to 1 decimal place.

(6)
(Total 9 marks)

2. (a) Given that $\sin^2\theta + \cos^2\theta \equiv 1$, show that $1 + \cot^2\theta \equiv \operatorname{cosec}^2\theta$.

(2)

(b) Solve, for $0 \leq \theta < 180°$, the equation

$$2\cot^2\theta - 9\operatorname{cosec}\theta = 3,$$

giving your answers to 1 decimal place.

(6)
(Total 8 marks)

3. (a) Given that $\sin^2\theta + \cos^2\theta \equiv 1$, show that $1 + \tan^2\theta \equiv \sec^2\theta$.

(2)

(b) Solve, for $0 \leq \theta < 360°$, the equation

$$2\tan^2\theta + \sec\theta = 1,$$

giving your answers to 1 decimal place.

(6)
(Total 8 marks)

4. (a) Using $\sin^2\theta + \cos^2\theta \equiv 1$, show that $\text{cosec}^2\theta - \cot^2\theta \equiv 1$.

(2)

(b) Hence, or otherwise, prove that

$$\text{cosec}^4\theta - \cot^4\theta \equiv \text{cosec}^2\theta + \cot^2\theta.$$

(2)

(c) Solve, for $90° < \theta < 180°$,

$$\text{cosec}^4\theta - \cot^4\theta = 2 - \cot\theta.$$

(6)
(Total 10 marks)

5.

a) Sketch the graph of y = arcsin x **(2 marks)**

b) Sketch the graph of y = arccos x **(2 marks)**

c) Sketch the graph of y = arctan x **(2 marks)**