2.1 Reciprocal & Inverse Trigonometric Functions

Question Paper

Course	Edexcel IAL Maths: Pure 3
Section	2. Trigonometry
Topic	2.1 Reciprocal & Inverse Trigonometric Functions
Difficulty	Easy

Time allowed: **50**

Score: **/42**

Percentage: **/100**

Question 1

Sketch the graph of $y = \operatorname{cosec} x$, for $-180° \leq x \leq 180°$.

[2 marks]

Question 2

(a) Write down the domain and range for the function $\arccos \theta$.

[2 marks]

Question 2

(b) Hence sketch the graph of $y = \arccos \theta$.

[2 marks]

Question 3

Solve the equation $\cot x = 3$, for $-\pi \leq x \leq \pi$, giving your answers to three significant figures.

[3 marks]

Question 4

Sketch the graph of $y = \sec\theta$, for $-\pi \le \theta \le \pi$.
Label any points of intersection with the coordinate axes and state the equations of any asymptotes.

[4 marks]

Question 5

Starting with the identity

$$\sin^2 x + \cos^2 x \equiv 1$$

show that

(i) $1 + \cot^2 x \equiv \operatorname{cosec}^2 x$
(ii) $\tan^2 x + 1 \equiv \sec^2 x$

[4 marks]

Question 6

Show that

$$\sec^2\theta \sin\theta \equiv \tan\theta \sec\theta$$

[3 marks]

Question 7

(a) Write down the domain and range for the function $\arcsin\theta$.

[2 marks]

Question 7

(b) Hence sketch the graph of $y = \arcsin\theta$.

[2 marks]

Question 8

Solve the equation $\operatorname{cosec}^2 x - 2\operatorname{cosec} x - 8 = 0$, for $0° \leq x \leq 360°$, giving your answers to one decimal place where appropriate.

[3 marks]

Question 9

Show that

$$\cot x \operatorname{cosec} x \sec x \equiv 1 + \cot^2 x$$

[3 marks]

Question 10

Solve the equation $\sec\theta\tan\theta - \sec\theta = 0$, for $0 \leq x \leq 2\pi$, giving your answers in exact form.

[4 marks]

Question 11

(a) Write down the domain and range for the function $\arctan\theta$.

[2 marks]

Question 11

(b) Hence sketch the graph of $y = \arctan\theta$.

[2 marks]

Question 12

(a) Sketch the graph of $y = 2\sec 2x$, for $-\pi < x < \pi$.

[2 marks]

Question 12

(b) Draw a suitable line on your graph to show that the equation $2\sec 2x = 4$ has four solutions in the range $-\pi \leq x \leq \pi$.

[2 marks]