



## Maths-it Podcast A2-02

A2 Core Revision

### Trigonometry 1

#### Topics

$\sin^{-1}$ ,  $\cos^{-1}$  and  $\tan^{-1}$ , inc. domains and graphs – cosec, sec and cot, inc. domains and graphs  
The identities  $1 + \tan^2 x \equiv \sec^2 x$  and  $1 + \cot^2 x \equiv \operatorname{cosec}^2 x$

#### Questions

1. It is given that  $\frac{\tan^2 x}{2} = \sec x + 7$ .
- (a) Show that the equation  $\frac{\tan^2 x}{2} = \sec x + 7$  can be written in the form  
$$\sec^2 x - 2\sec x - 15 = 0$$
 (2)
- (b) Hence show that  $\cos x = \frac{1}{5}$  or  $\cos x = -\frac{1}{3}$ . (3)
- (c) Hence, or otherwise, solve the equation  $\frac{\tan^2 x}{2} = \sec x + 7$ , giving all values of  $x$  to the nearest degree in the interval  $0^\circ < x < 360^\circ$ . (3)
- (Total 8 marks)**
2. (a) Sketch the graph of  $y = \sin^{-1} x$ . (2)
- (b) State the domain and range of the function  $f(x) = \sin^{-1} x$ . (2)
- (Total 4 marks)**
3. It is given that  $3\operatorname{cosec}^2 x = -4\cot x$ .
- (a) Show that the equation  $3\operatorname{cosec}^2 x = -4\cot x$  can be written in the form  
$$3\cot^2 x + 4\cot x + 3 = 0$$
 (2)
- (b) Hence show that  $\tan x = -1$  or  $\tan x = -\frac{1}{3}$ . (2)
- (c) Hence, or otherwise, solve the equation,  $3\operatorname{cosec}^2 x = -4\cot x$  giving all values of  $x$  in radians to 1 d.p. in the interval  $-\pi < x < \pi$ . (3)
- (Total 7 marks)**

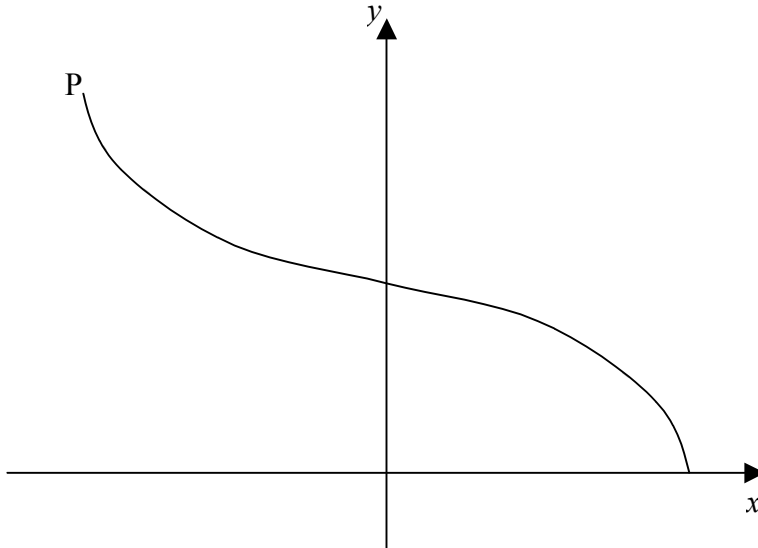


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4. The sketch shows the graph of  $y = \cos^{-1} x$ .



- (a) Write down the coordinates of the point P, the endpoint of the graph.

(2)

- (b) Sketch the graph of  $y = \cos^{-1}(-x) - \pi$

(3)

**(Total 5 marks)**