



Air maths tuition

Interact, engage and perform

Trig Equation

| Past Paper Question | C3 Edexcel January 2013

Q6(ii)

(a) Show that $\cos 2\theta + \sin \theta = 1$ may be written in the form $k \sin^2 \theta - \sin \theta = 0$, stating the value of k .

(b) Hence solve, for $0 \leq \theta < 360^\circ$, the equation $\cos 2\theta + \sin \theta = 1$

$$\text{a) } \cos 2\theta + \sin \theta = 1$$

$$\therefore 1 - 2\sin^2 \theta + \sin \theta = 1$$

$$\therefore 2\sin^2 \theta - \sin \theta = 0$$

$$\therefore k = 2$$

$$\text{b) } \therefore 2\sin^2 \theta - \sin \theta = 0$$

$$\therefore \sin \theta (2\sin \theta - 1) = 0$$

$$\therefore \sin \theta = 0 \text{ or } 2\sin \theta - 1 = 0$$

$$\therefore \sin \theta = 0 \text{ or } \sin \theta = \frac{1}{2}$$

$$\text{when } \sin \theta = 0$$

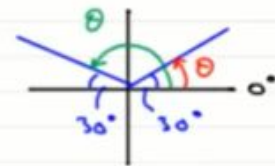
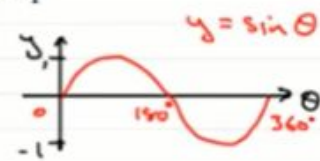
$$\therefore \theta = 0^\circ, 180^\circ$$

$$\text{when } \sin \theta = \frac{1}{2}$$

$$\therefore \theta = \sin^{-1} \frac{1}{2}$$

$$\therefore \theta = 30^\circ, 150^\circ$$

$$\therefore \theta = 0^\circ, 30^\circ, 150^\circ, 180^\circ$$



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