

Solving Trig EquationsSolve for $t \in [0, 2\pi[$

1) $\sin t = \frac{1}{2}$

$$t \in \left\{ \frac{\pi}{6}, \frac{5\pi}{6} \right\}$$

2) $2\sin t + 1 = 0$

$$\begin{aligned} \frac{2\sin t}{2} &= -\frac{1}{2} \\ \sin t &= -\frac{1}{2} \\ t &\in \left\{ \frac{7\pi}{6}, \frac{11\pi}{6} \right\} \end{aligned}$$

3) $\cos^2 t = 1$

$$\cos t = \pm 1$$

$$t \in \{0, \pi\}$$

Since $t \in [0, 2\pi[$ Solve for $t \in \mathbb{R} \longrightarrow$

Here we have to consider all the real numbers.

So...take in to consideration the period (2π - a full revolution of the unit circle) and the number of times, n , it can go around

1) $\cos t = 0$

Ask:

Where is $\cos t = 0$?

$$t \in \left\{ \frac{\pi}{2} + 2\pi n, \frac{3\pi}{2} + 2\pi n \right\} \text{ where } n \in \mathbb{Z}$$

2) $\sin t = \frac{\sqrt{3}}{2}$

$$t \in \left\{ \frac{\pi}{3} + 2\pi n, \frac{2\pi}{3} + 2\pi n \right\} \text{ where } n \in \mathbb{Z}$$