

Trig Identity Questions – Find all the Values in the Region

$$\sin x = \frac{\sqrt{2}}{2} \quad 0 \leq x \leq 360$$

$$\tan x = 1 \quad -180 \leq x \leq 180$$

$$\sin 2x = \frac{\sqrt{3}}{2} \quad 0 \leq x \leq 2\pi$$

$$\cos\left(\frac{1}{2}x\right) = \frac{\sqrt{3}}{2} \quad -\pi \leq x \leq \pi$$

$$2\cos^2 x = \cos x \quad -180 \leq x \leq 180$$

$$\cos^2 x - \cos x - 2 = 0 \quad 0 \leq x \leq 2\pi$$

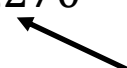
Extension...

$$3\sin x = \sqrt{3}\cos x$$

$$0 \leq x \leq 360$$

$$x \neq 90, 270$$

But why?



Trig Identity Questions – Answers

$$\sin x = \frac{\sqrt{2}}{2}, 0 \leq x \leq 360$$

$$x = 45, 135$$

$$\tan x = 1, -180 \leq x \leq 180$$

$$x = 45, -135$$

$$\sin 2x = \frac{\sqrt{3}}{2}, 0 \leq x \leq 2\pi$$

$$2x = \frac{\pi}{3}, \frac{2\pi}{3}, \frac{7\pi}{3}, \frac{8\pi}{3}$$
$$\Rightarrow x = \frac{\pi}{6}, \frac{\pi}{3}, \frac{7\pi}{6}, \frac{4\pi}{3}$$

$$\cos\left(\frac{1}{2}x\right) = \frac{\sqrt{3}}{2}, -\pi \leq x \leq \pi$$

$$\frac{x}{2} = \frac{\pi}{6}, -\frac{\pi}{6}$$
$$\Rightarrow x = \pm \frac{\pi}{3}$$

$$2\cos^2 x = \cos x, -180 \leq x \leq 180$$

$$x = \pm 60, \pm 90$$

$$\cos^2 x - \cos x - 2 = 0, 0 \leq x \leq 2\pi$$

$$x = \pi$$

Extension...

$$3\sin x = \sqrt{3}\cos x, 0 \leq x \leq 360$$

$$x = 30, 210$$

Trig Identity Questions – Find the General Solutions

$$\sin x = \frac{\sqrt{2}}{2}$$

$$\tan x = 1,$$

$$\sin 2\theta = \frac{\sqrt{3}}{2}$$

$$\cos\left(\frac{1}{2}x\right) = \frac{\sqrt{3}}{2}$$

$$2\cos^2 x = \cos x$$

$$\cos^2 x - \cos x - 2 = 0$$

$$3\sin x = \sqrt{3}\cos x$$