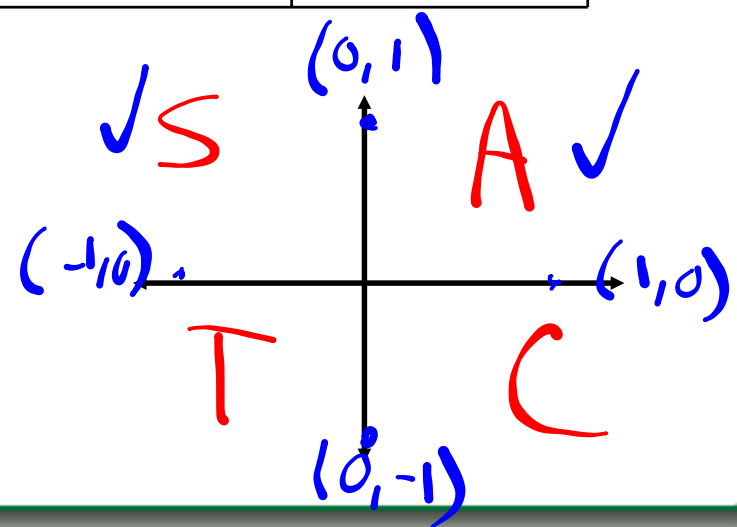




Notes 3.1 - Solving Basic Trig Equations

*** WARM UP ***

RATIO \ θ	0	$\frac{\pi}{6}$	$\frac{\pi}{4}$	$\frac{\pi}{3}$	$\frac{\pi}{2}$
sin	0	$\frac{1}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{\sqrt{3}}{2}$	1
cos	1	$\frac{\sqrt{3}}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{1}{2}$	0
tan	0	$\frac{\sqrt{3}}{3}$	1	$\sqrt{3}$	undefined.





Notes 3.1 - Solving Basic Trig Equations

* EXPLORATION *

What is a solution to an equation?

$$3x = 6$$

What is the solution to the trig function below?

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

$$\theta = \frac{\pi}{4}, \frac{3\pi}{4}$$





Notes 3.1 - Solving Basic Trig Equations

θ	0	$\frac{\pi}{6}$	$\frac{\pi}{4}$	$\frac{\pi}{3}$	$\frac{\pi}{2}$
sin	0	$\frac{1}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{\sqrt{3}}{2}$	1
cos	1	$\frac{\sqrt{3}}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{1}{2}$	0
tan	0	$\frac{\sqrt{3}}{3}$	1	$\sqrt{3}$	undefined

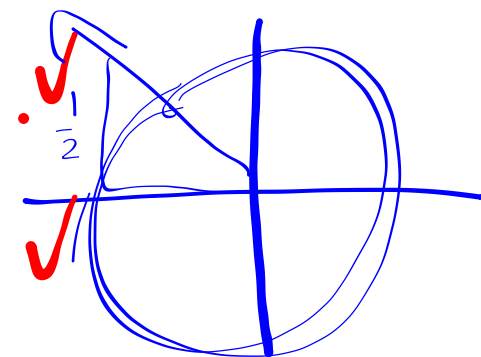
Solve for θ .

$$-\frac{1}{2} = \cos \theta$$

$$\theta = \frac{2\pi}{3}, \frac{4\pi}{3}$$

$$\theta = \frac{2\pi}{3} + 2\pi(n)$$

$$\theta = \frac{4\pi}{3} + 2\pi(n)$$





Notes 3.1 - Solving Basic Trig Equations

θ	0	$\frac{\pi}{6}$	$\frac{\pi}{4}$	$\frac{\pi}{3}$	$\frac{\pi}{2}$
sin	0	$\frac{1}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{\sqrt{3}}{2}$	1
cos	1	$\frac{\sqrt{3}}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{1}{2}$	0
tan	0	$\frac{\sqrt{3}}{3}$	1	$\sqrt{3}$	undefined

Solve for θ where $0 \leq \theta < 2\pi$.

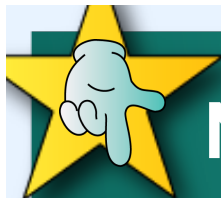
$$\cos \theta = -\frac{\sqrt{2}}{2}$$

$$\theta = \frac{3\pi}{4}, \frac{5\pi}{4}$$

$$-\frac{\sqrt{3}}{3} = \tan \theta$$

$$\theta = \frac{5\pi}{6}, \frac{11\pi}{6}$$





Notes 3.1 - Solving Basic Trig Equations

θ	0	$\frac{\pi}{6}$	$\frac{\pi}{4}$	$\frac{\pi}{3}$	$\frac{\pi}{2}$
sin	0	$\frac{1}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{\sqrt{3}}{2}$	1
cos	1	$\frac{\sqrt{3}}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{1}{2}$	0
tan	0	$\frac{\sqrt{3}}{3}$	1	$\sqrt{3}$	undefined

Solve for θ where $0 \leq \theta < 2\pi$.

$$\left[1 + \frac{1}{2} \sin \theta = \frac{5}{4} \right] \quad 4$$

$$\cancel{1} + 2 \sin \theta = \cancel{5}$$

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

$$\cancel{-3} - \frac{6 \csc \theta}{-6} = \frac{4\sqrt{3}}{-6} - \cancel{3}$$

$$\csc \theta = -\frac{2\sqrt{3}}{3}$$

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



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

$$\theta = \frac{\pi}{6}, \frac{5\pi}{6}$$

$$\theta = \frac{4\pi}{3}, \frac{5\pi}{3}$$

$$x = 2$$

$$\frac{1}{x} = \frac{1}{2}$$



Notes 3.1 - Solving Basic Trig Equations

θ	0	$\frac{\pi}{6}$	$\frac{\pi}{4}$	$\frac{\pi}{3}$	$\frac{\pi}{2}$
sin	0	$\frac{1}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{\sqrt{3}}{2}$	1
cos	1	$\frac{\sqrt{3}}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{1}{2}$	0
tan	0	$\frac{\sqrt{3}}{3}$	1	$\sqrt{3}$	undefined

Solve for θ where $0 \leq \theta < 2\pi$.

$$\begin{aligned} -2 + \cos \theta &= 2 - 3\cos \theta \\ +2 + 3\cos \theta &+ 2 + 3\cos \theta \end{aligned}$$

$$\cos \theta = \frac{4}{4}$$

$$\cos \theta = 1$$

$$\theta = 0$$

$$\left[\frac{-12 - \sqrt{3}}{4} - 3\cot \theta = -3 - \frac{15}{4}\cot \theta \right] 4$$

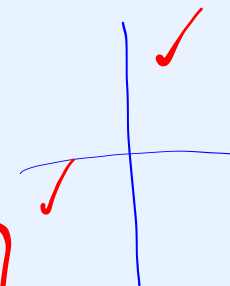
$$\begin{aligned} -12 - \sqrt{3} - 12\cot \theta &= -12 - 15\cot \theta \\ + 12\cot \theta &+ 12\cot \theta \end{aligned}$$

$$\frac{-\sqrt{3}}{-3} = \frac{-3\cot \theta}{-3}$$

$$\frac{\sqrt{3}}{3} = \cot \theta$$

$$\tan \theta = \sqrt{3}$$

$$\theta = \frac{\pi}{3}, \frac{4\pi}{3}$$





Notes 3.1 - Solving Basic Trig Equations

θ	0	$\frac{\pi}{6}$	$\frac{\pi}{4}$	$\frac{\pi}{3}$	$\frac{\pi}{2}$
sin	0	$\frac{1}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{\sqrt{3}}{2}$	1
cos	1	$\frac{\sqrt{3}}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{1}{2}$	0
tan	0	$\frac{\sqrt{3}}{3}$	1	$\sqrt{3}$	u.d.

Solve for θ where $0 \leq \theta < 2\pi$.

$$\cancel{-3} + \frac{4 \csc \theta}{4} = \frac{-2\sqrt{3}}{4} \cancel{-3}$$

$$\frac{2}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} = \frac{2\sqrt{3}}{3}$$

$$\csc \theta = -\frac{\sqrt{3}}{2}$$

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

NO SOLUTION

