

# \*You CANNOT $\div$ by Trig Functions!

Name: Key

Precalculus

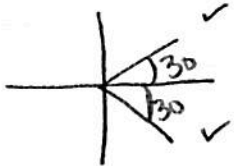
Solving Trig Equations (5.3) Day 1

Solve each trig equation for  $0 \leq \theta < 2\pi$

1.  $2\cos\theta = \frac{\sqrt{3}}{2}$

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

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



2.  $4\sin\theta + 5 = 0$

$\sin\theta = -\frac{5}{4}$

$\sin\theta = -\frac{5}{4} \rightarrow$  Not on unit circle

No solution

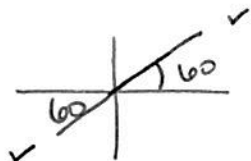
3.  $3\cot\theta - \sqrt{3} = 0$

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

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

$\tan\theta = \frac{3}{\sqrt{3}} \text{ or } \sqrt{3}$

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



4.  $4\cos\theta + 4 = 0$

$\cos\theta = -1$

$\cos\theta = -1$

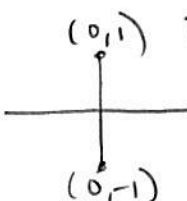
$\theta = \pi$



5.  $\sqrt{\sin^2\theta} = 1$

$\sin\theta = \pm 1$

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



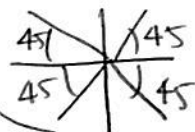
6.  $2\cos^2\theta + 3 = 4$

$2\cos^2\theta = 1$

$\sqrt{\cos^2\theta} = \pm \frac{1}{\sqrt{2}} \rightarrow \frac{\sqrt{1}}{\sqrt{2}} = \frac{1}{\sqrt{2}} = \frac{\sqrt{2}}{2}$

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

$\theta = \frac{\pi}{4}, \frac{3\pi}{4}, \frac{5\pi}{4}, \frac{7\pi}{4}$

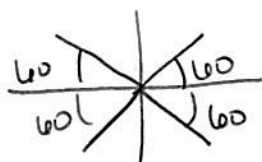


7.  $\sqrt{\sec^2\theta} = 4$

$\sec\theta = \pm 2$

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

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

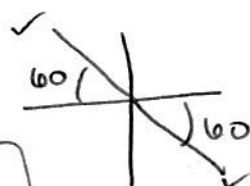


8.  $2\tan\theta + \sqrt{3} = \tan\theta$

$\tan\theta + \sqrt{3} = 0$

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

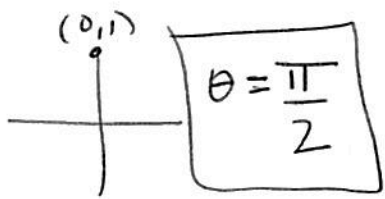
$\theta = \frac{2\pi}{3}, \frac{5\pi}{3}$



$\theta = \frac{\pi}{3}, \frac{2\pi}{3}, \frac{4\pi}{3}, \frac{5\pi}{3}$

$$9. (\sin\theta - 1)(\cos\theta + 2) = 0$$

$$\begin{aligned} \sin\theta - 1 &= 0 \\ \sin\theta &= 1 \end{aligned}$$

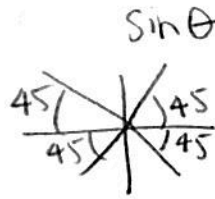


$$\begin{aligned} \cos\theta + 2 &= 0 \\ \cos\theta &= -2 \end{aligned}$$

Not on unit circle  
No Sol.

$$10. (2\sin^2\theta - 1)(\sin^2\theta - 1) = 0$$

$$\begin{aligned} 2\sin^2\theta - 1 &= 0 \\ \sqrt{\sin^2\theta} &= \pm \frac{1}{\sqrt{2}} \rightarrow \pm \frac{\sqrt{2}}{2} \end{aligned}$$



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

$$\begin{aligned} \sin^2\theta - 1 &= 0 \\ \sqrt{\sin^2\theta} &= \pm 1 \\ (0, 1) \sin\theta &= \pm 1 \end{aligned}$$

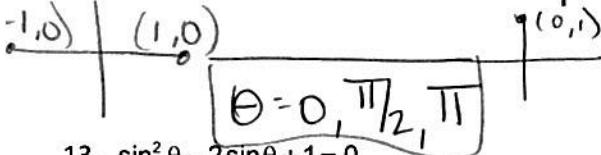
$$\theta = \frac{\pi}{4}, \frac{3\pi}{4}, \frac{5\pi}{4}, \frac{7\pi}{4}, \frac{\pi}{2}, \frac{3\pi}{2}$$

$$11. \sin^2\theta = \sin\theta$$

$$\begin{aligned} \sin^2\theta - \sin\theta &= 0 \\ \sin\theta(\sin\theta - 1) &= 0 \end{aligned}$$

$$\sin\theta = 0$$

$$\begin{aligned} \sin\theta - 1 &= 0 \\ \sin\theta &= 1 \end{aligned}$$



$$13. \sin^2\theta - 2\sin\theta + 1 = 0$$

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

$$\begin{aligned} \sin\theta - 1 &= 0 \\ \sin\theta &= 1 \end{aligned}$$



$$\theta = \frac{\pi}{2}$$

$$15. 2\cos^2\theta + \cos\theta = 1$$

$$2\cos^2\theta + \cos\theta - 1 = 0$$

$$(2\cos\theta - 1)(\cos\theta + 1) = 0$$

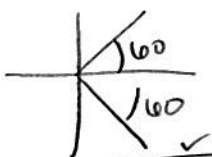
$$2\cos\theta - 1 = 0$$

$$2\cos\theta = 1$$

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

$$\cos\theta + 1 = 0$$

$$\cos\theta = -1$$

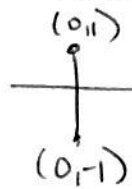


$$\theta = \frac{\pi}{3}, \frac{5\pi}{3}, \pi$$

$$12. \cos\theta \sin\theta - \cos\theta = 0$$

$$\cos\theta(\sin\theta - 1) = 0$$

$$\cos\theta = 0$$



$$\begin{aligned} \sin\theta - 1 &= 0 \\ \sin\theta &= 1 \end{aligned}$$



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

$$14. \cos^2\theta - 3\sin\theta = 3$$

$$(1 - \sin^2\theta) - 3\sin\theta = 3$$

move to  $\rightarrow$

$$\sin^2\theta + 3\sin\theta + 2 = 0$$

$$(\sin\theta + 2)(\sin\theta + 1) = 0$$

$$\sin\theta + 2 = 0$$

$$\sin\theta = -2$$

Not on unit circle

No Sol.

$$\sin\theta + 1 = 0$$

$$\sin\theta = -1$$



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