$$\left(x-\frac{\sqrt{3}}{2}\right)\left(x+\frac{\sqrt{3}}{2}\right)= x^2-\frac{3}{4}$$

$|x|=3 \Rightarrow$
$x=3$ OR $x=-3$

Solve $\cos^2\theta - \frac{3}{4} = 0$

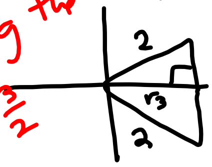
$\cos^2\theta = \frac{3}{4}$

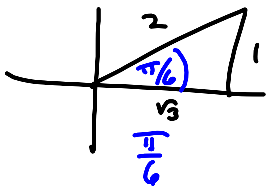
$\cos\theta = \pm\sqrt{\frac{3}{4}}$

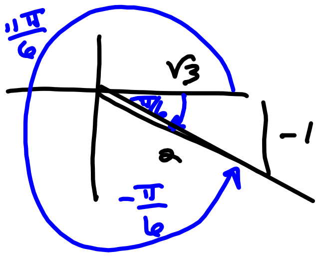
$\cos\theta = \pm\frac{\sqrt{3}}{2}$

$x^2 = B \Rightarrow$
$\sqrt{x^2} = \sqrt{B}$
$|x| = \sqrt{B}$
$x=\sqrt{B}$ OR $x=-\sqrt{B}$
$x = \pm\sqrt{B}$

Oops! Just did $\cos\theta = +\frac{\sqrt{3}}{2}$ missing the $\cos\theta = -\frac{\sqrt{3}}{2}$



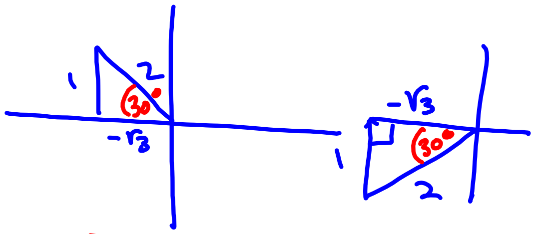




$\frac{\pi}{6} + 2n\pi,\ n\in\mathbb{Z}$
$-\frac{\pi}{6} + 2n\pi,\ n\in\mathbb{Z}$ } General Solution.

THAT'S HALF OF IT.

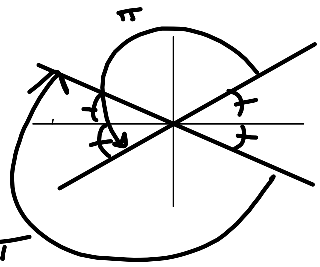
$\cos\theta = -\frac{\sqrt{3}}{2}$ pics



$\pi - \frac{\pi}{6} = \frac{5\pi}{6}$ $\pi + \frac{\pi}{6} = \frac{7\pi}{6}$

$\frac{5\pi}{6} + 2n\pi$

$\frac{7\pi}{6} + 2n\pi$



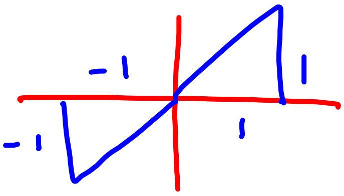
So, complete answer:

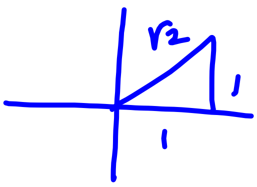
OK
$\frac{\pi}{6} + 2n\pi$
$\frac{5\pi}{6} + 2n\pi$
$\frac{7\pi}{6} + 2n\pi$
$\frac{11\pi}{6} + 2n\pi$

Elegant
$\frac{\pi}{6} + n\pi$
$\frac{5\pi}{6} + n\pi$
$\forall n\in\mathbb{Z}$

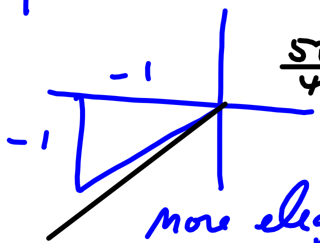
$\tan\theta - 1 = 0$

$\tan\theta = 1$





$\frac{\pi}{4}$



$\frac{5\pi}{4}$ OR $-\frac{3\pi}{4}$

More elegant.
Answers are π apart.

DIGITAL

$$\left.\begin{array}{l}\frac{\pi}{4} + 2n\pi,\ n \in \mathbb{Z} \\ \frac{5\pi}{4} + 2n\pi,\ n \in \mathbb{Z}\end{array}\right\}$$ Collapses to $\frac{\pi}{4} + n\pi,\ n \in \mathbb{Z}$

All Legit

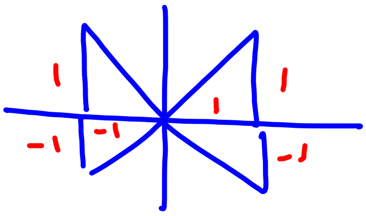
$-\frac{3\pi}{4} + n\pi,\ n \in \mathbb{Z}$

$\frac{5\pi}{4} + n\pi,\ n \in \mathbb{Z}$

$$\tan^2\theta - 1 = 0$$

$$\tan^2\theta = 1$$

$$\tan\theta = \pm 1$$



$$\frac{\pi}{4} + 2n\pi$$

$$\frac{3\pi}{4} + 2n\pi$$

$$\frac{5\pi}{4} + 2n\pi$$

$$\frac{7\pi}{4} + 2n\pi$$

$$\left.\begin{array}{l}\frac{\pi}{4} + 2n\pi \\ \frac{5\pi}{4} + 2n\pi\end{array}\right\} \to \frac{\pi}{4} + n\pi$$

$$\left.\begin{array}{l}\frac{3\pi}{4} + 2n\pi \\ \frac{7\pi}{4} + 2n\pi\end{array}\right\} \to \frac{3\pi}{4} + n\pi$$

$$\left.\begin{array}{l}\frac{\pi}{4} + n\pi \\ \frac{3\pi}{4} + n\pi\end{array}\right\} \to \frac{\pi}{4} + \frac{n\pi}{2}$$

$\forall\, n \in \mathbb{Z}$

$$\tan^2 x - \tan^2 x \sin^2 x$$

$$= (\tan^2 x)(1 - \sin^2 x)$$

$$= \left(\frac{\sin^2 x}{\cancel{\cos^2 x}}\right)\left(\cancel{\cos^2 x}\right) = \sin^2 x$$

$\boxed{\sin^2 x + \cos^2 x = 1}$

$1 - \sin^2 x = \cos^2 x$

$1 - \cos^2 x = \sin^2 x$

$\cot^2 x + 1 = \csc^2 x$ *

$\tan^2 x + 1 = \sec^2 x$ *

$\sin^2 x + \cos^2 x = 1$

Memorize

To derive the other Pythagorean Identities, start w/ $\tan^2 x$, $\cot^2 x$

$$\tan^2 x = \frac{\sin^2 x}{\cos^2 x} = \frac{1 - \cos^2 x}{\cos^2 x} = \frac{1}{\cos^2 x} - 1 = \sec^2 x - 1$$

$$\cot^2 x = \frac{\cos^2 x}{\sin^2 x} = \frac{1 - \sin^2 x}{\sin^2 x} = \csc^2 x - 1$$

$$= \left(\frac{\cos x}{\sin x}\right)^2 = \frac{\cos^2 x}{\sin^2 x}$$

$$\frac{5}{7} = \frac{2+3}{7} = \frac{2}{7} + \frac{3}{7}$$

$$\frac{1 - \sin^2 x}{\sin^2 x} = \frac{1}{\sin^2 x} - \frac{\sin^2 x}{\sin^2 x} = \csc^2 x - 1$$