

Warm-up

April 18, 2017

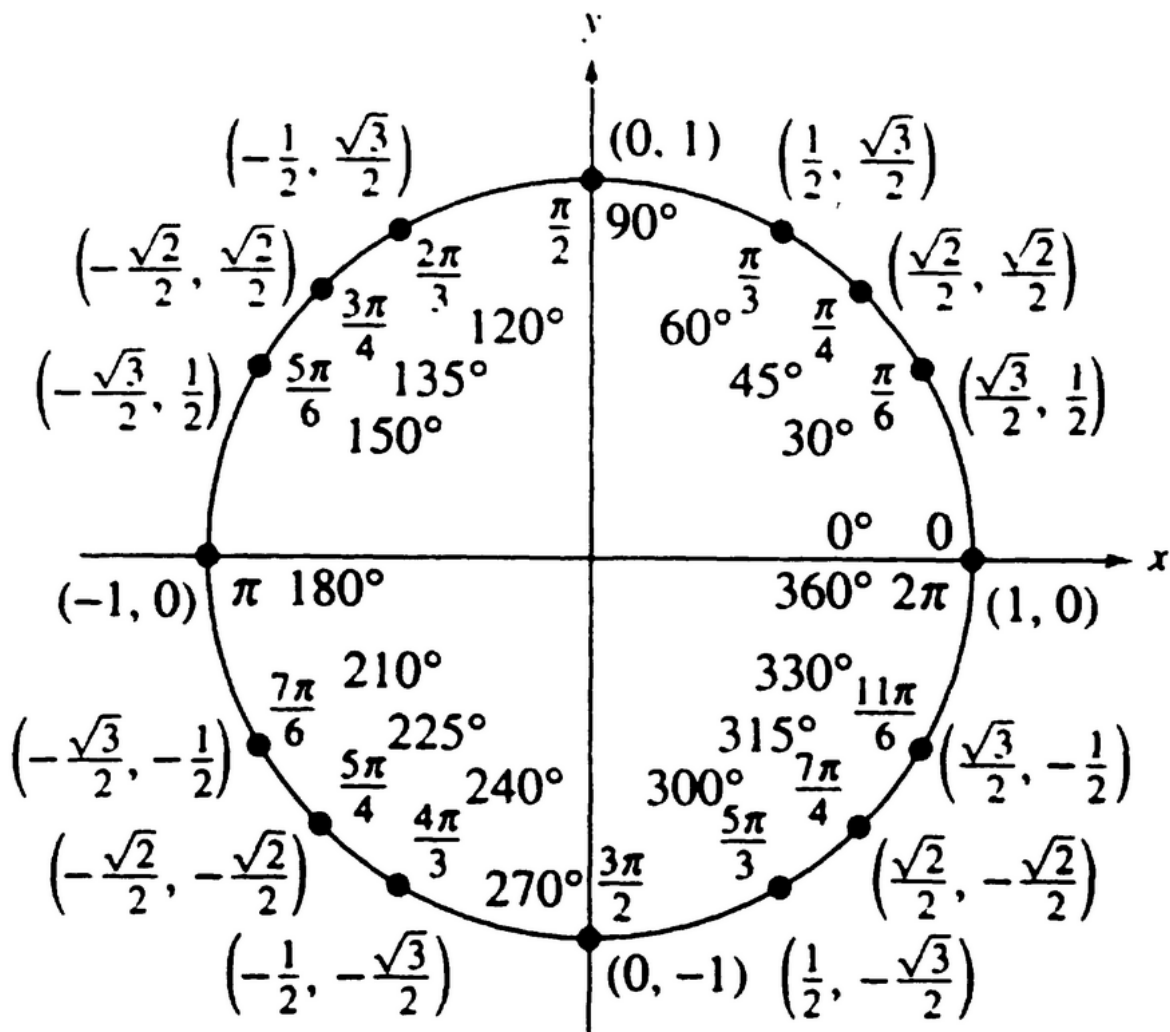
solve.

$$\begin{array}{r} 4\sin^2 x - 3 = 0 \\ \quad \quad \quad +3 \quad +3 \\ \hline \frac{4\sin^2 x}{4} = \frac{3}{4} \end{array}$$

$$\sqrt{\sin^2 x} = \sqrt{3/4}$$

$$\begin{array}{r} \sin x = \pm \frac{\sqrt{3}}{2} \\ \cdot \sin \quad \quad \quad - \sin \end{array}$$

$$x = 60^\circ, 120^\circ, 240^\circ, 300^\circ$$



$$4 \sin^2 x - 3 = 0$$

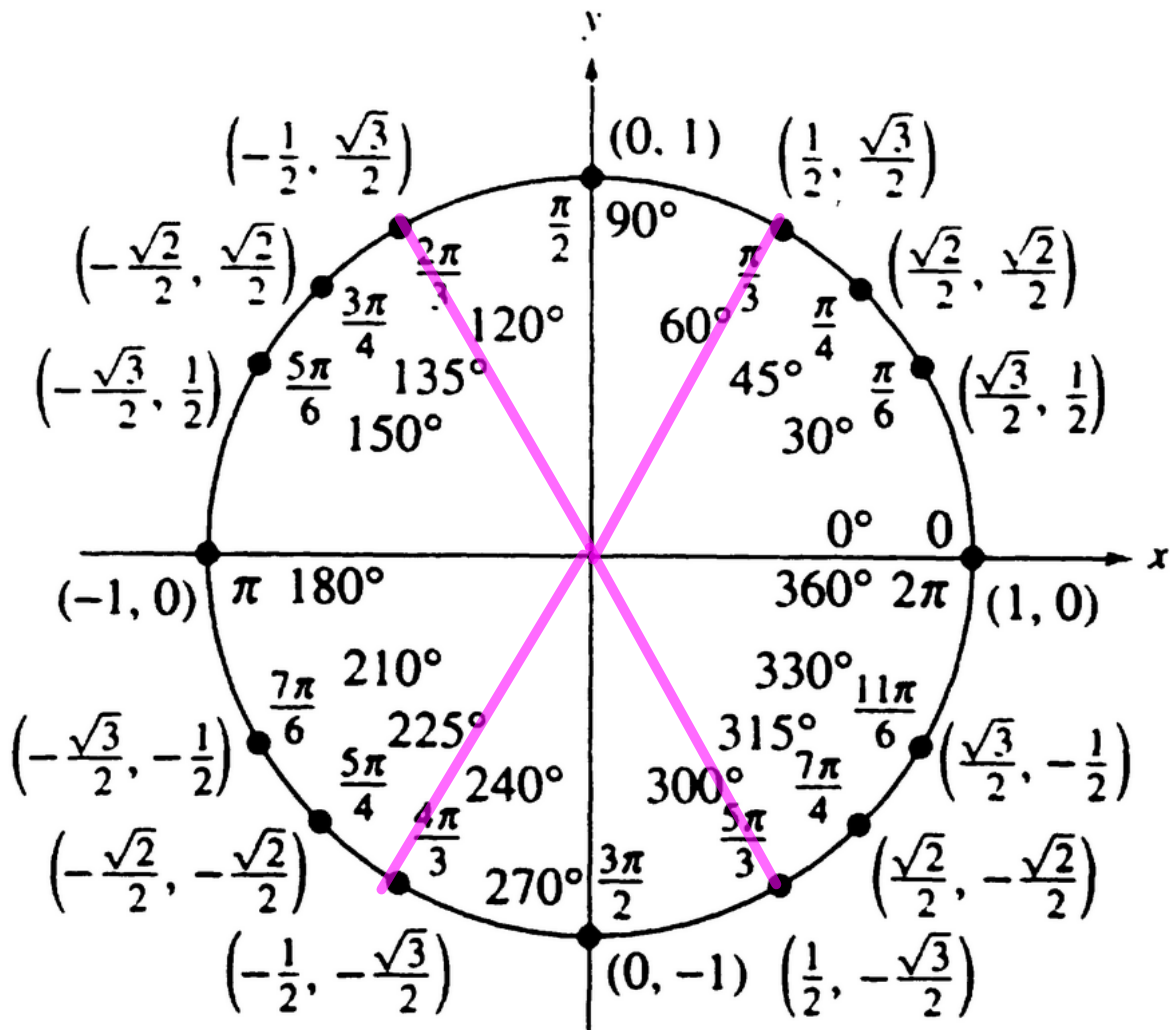
$$\quad \quad \quad +3 \quad +3$$

$$\frac{4 \sin^2 x}{4} = \frac{3}{4}$$

$$\sqrt{\sin^2 x} = \sqrt{\frac{3}{4}} = \frac{\sqrt{3}}{\sqrt{4}} = \pm \frac{\sqrt{3}}{2}$$

$$\cancel{\sin x} = \left(\sin x \right) = \left(\pm \frac{\sqrt{3}}{2} \right)$$

$$x = 60^\circ, 120^\circ, 240^\circ, 300^\circ$$



Solve.

$$3x^2 - 2 = 10$$

+ 2 + 2

$$\frac{3x^2}{3} = \frac{12}{3}$$

$$\sqrt{x^2} = \sqrt{4}$$

$$x = \pm 2$$

$$3 \sec^2 x - 2 = 10$$

+2 +2

$$\frac{3 \sec^2 x}{3} = \frac{12}{3}$$

$$\sec^2 x = 4$$

$$\sqrt{(\sec x)^2} = \sqrt{4}$$

$$(\sec x) = (\pm 2)$$

$$\sec(\cos x) = \left(\frac{1}{\cos x} \right) = \left(1 \pm \frac{1}{2} \right)$$

$$x = 60^\circ, 120^\circ, 240^\circ, 300^\circ$$

Solve.

$$3 \tan^2 x - 26 = 1$$

$$\quad \quad \quad +26 \quad +26$$

$$\frac{3 \tan^2 x}{3} = \frac{27}{3}$$

$$\tan^2 x = 9$$

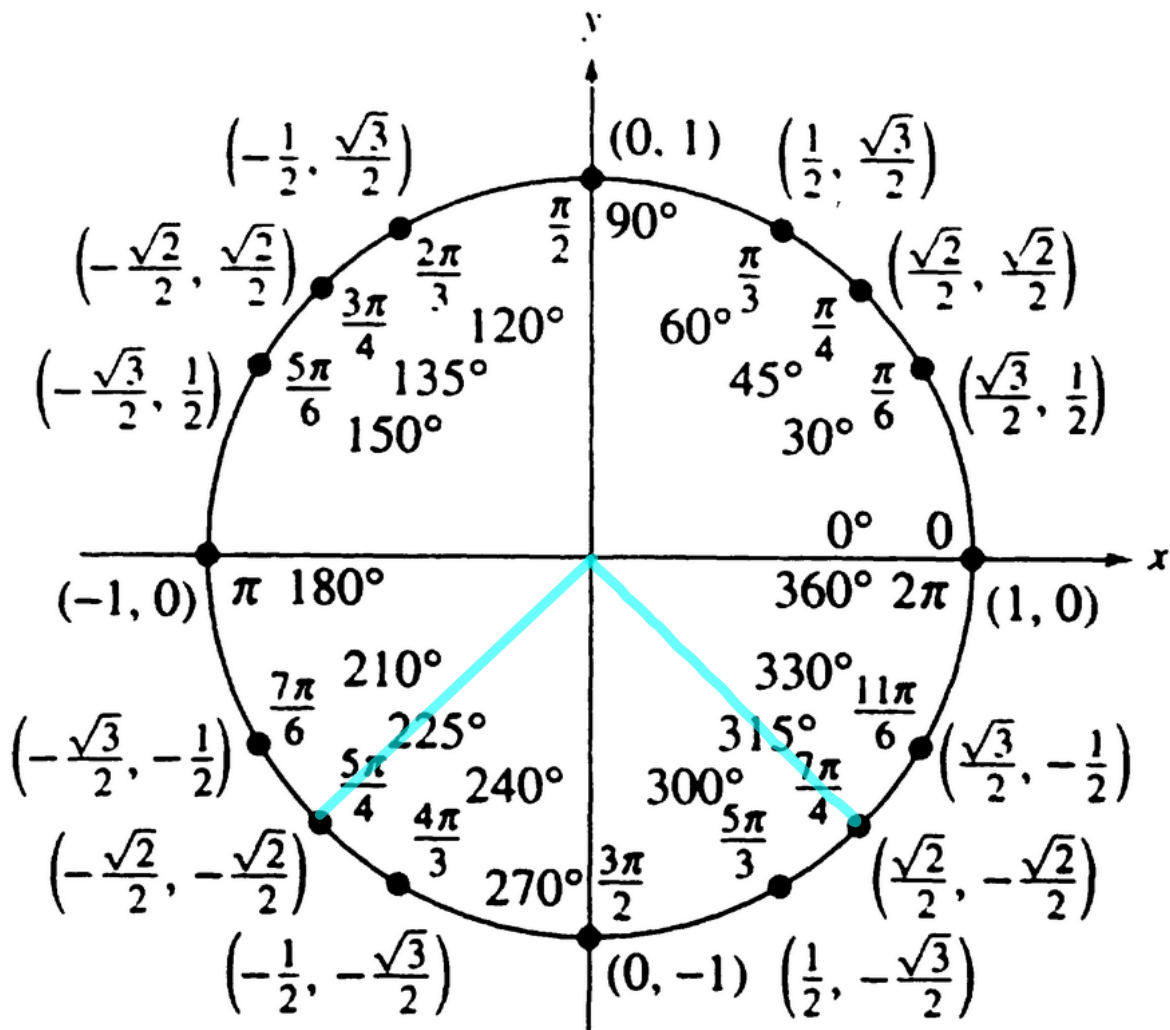
$$\sqrt{(\tan x)^2} = \sqrt{9}$$

$$\cancel{\tan}(\tan x) = (\pm 3)$$

$$\tan x = (\pm 3)$$

$$X = 71.56^\circ, 108.44^\circ,$$

$$251.56^\circ, 288.44^\circ$$



Solve by combining like terms

One trig

$$\sin x + \sqrt{2} = -\sin x$$

$$\begin{array}{r} +\sin x \\ \hline \end{array} \quad \begin{array}{r} +\sin x \\ \hline \end{array}$$

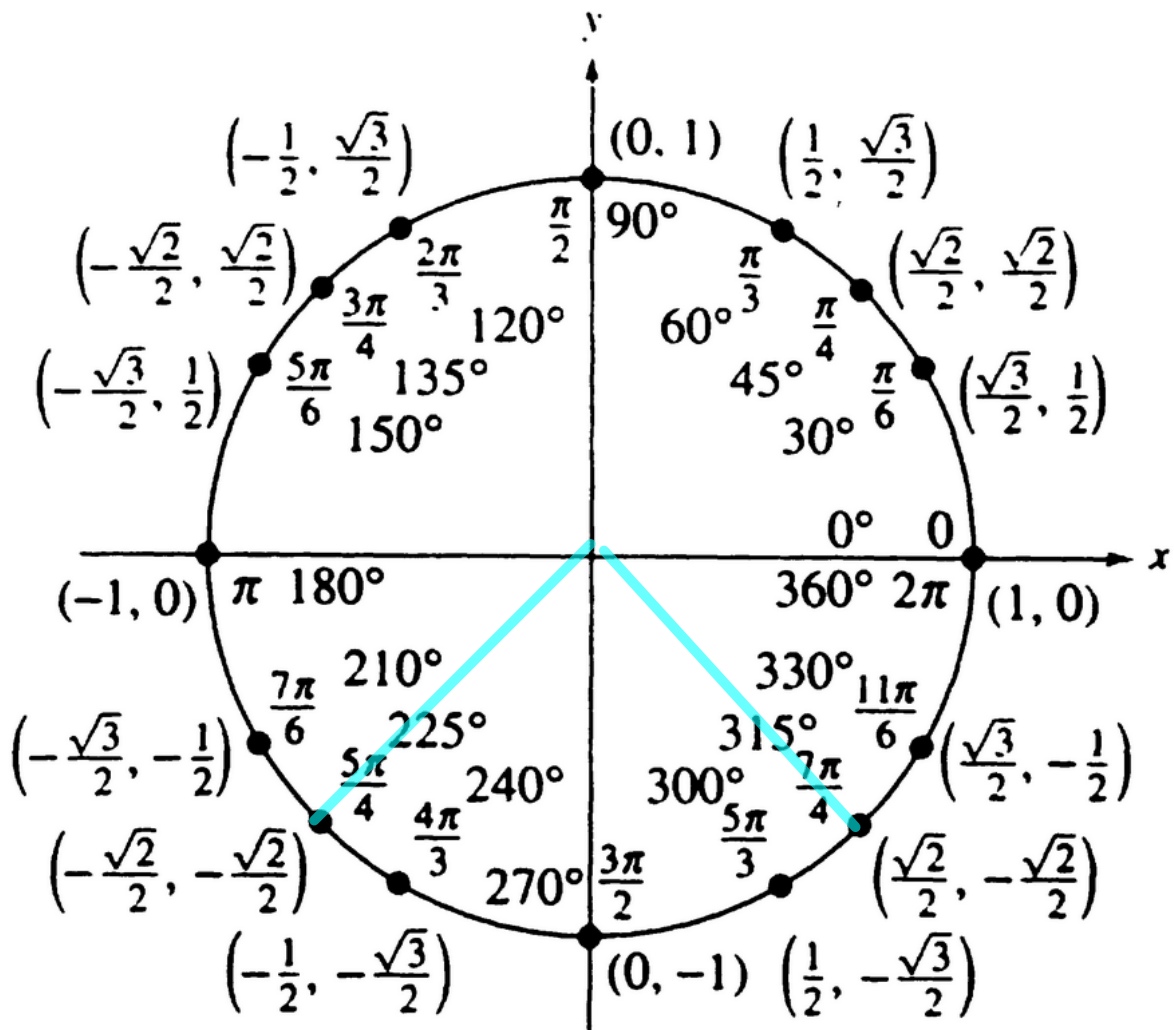
$$2\sin x + \sqrt{2} = 0$$

$$\begin{array}{r} -\sqrt{2} \\ \hline \end{array} \quad \begin{array}{r} -\sqrt{2} \\ \hline \end{array}$$

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

$$\sin^{-1}(\sin x) = \left(-\frac{\sqrt{2}}{2} \right)$$

$$x = 225^\circ, 315^\circ$$



Trigfun.

$$\textcircled{1} \quad \sin x + 2 = 3$$

$$\cancel{\sin x} + \underset{-2}{-2} = \underset{-2}{-2} + 3$$
$$\sin x = 1$$

$$x = 90^\circ$$

Solve with square roots

$$3 \tan^2 x - 1 = 0$$

+1 +1

$$\frac{3 \tan^2 x}{3} = \frac{1}{3}$$

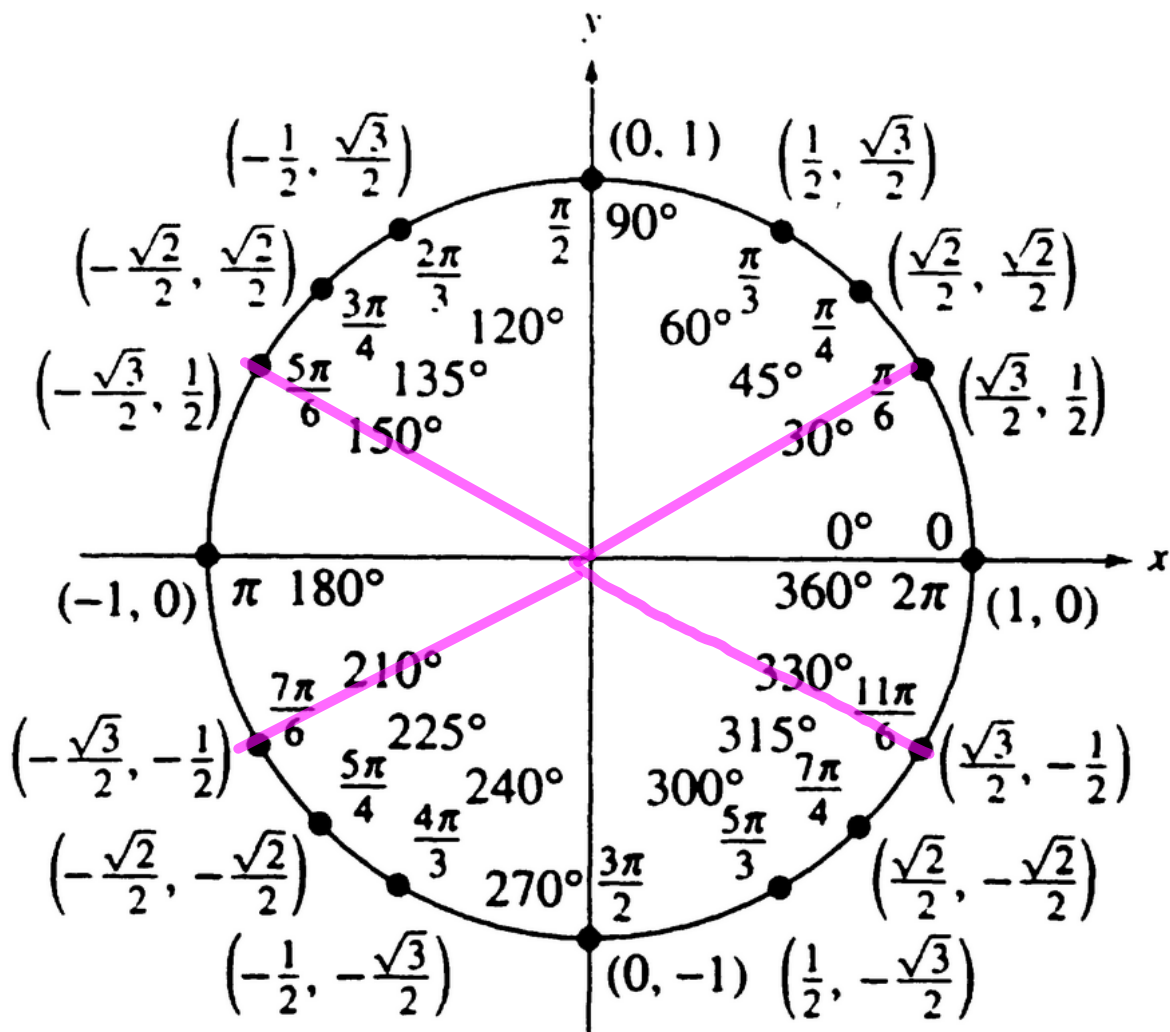
$$(\tan x)^2 = \sqrt{\frac{1}{3}}$$

$$\cancel{\tan} \tan x = \pm \frac{1}{\sqrt{3}}$$

x/5

$$x = 30^\circ, 150^\circ, 210^\circ, 330^\circ$$

One trig
Itz squared



⑦

$$\sec^2 x - 1 = 0$$

$$+1 \quad +1$$

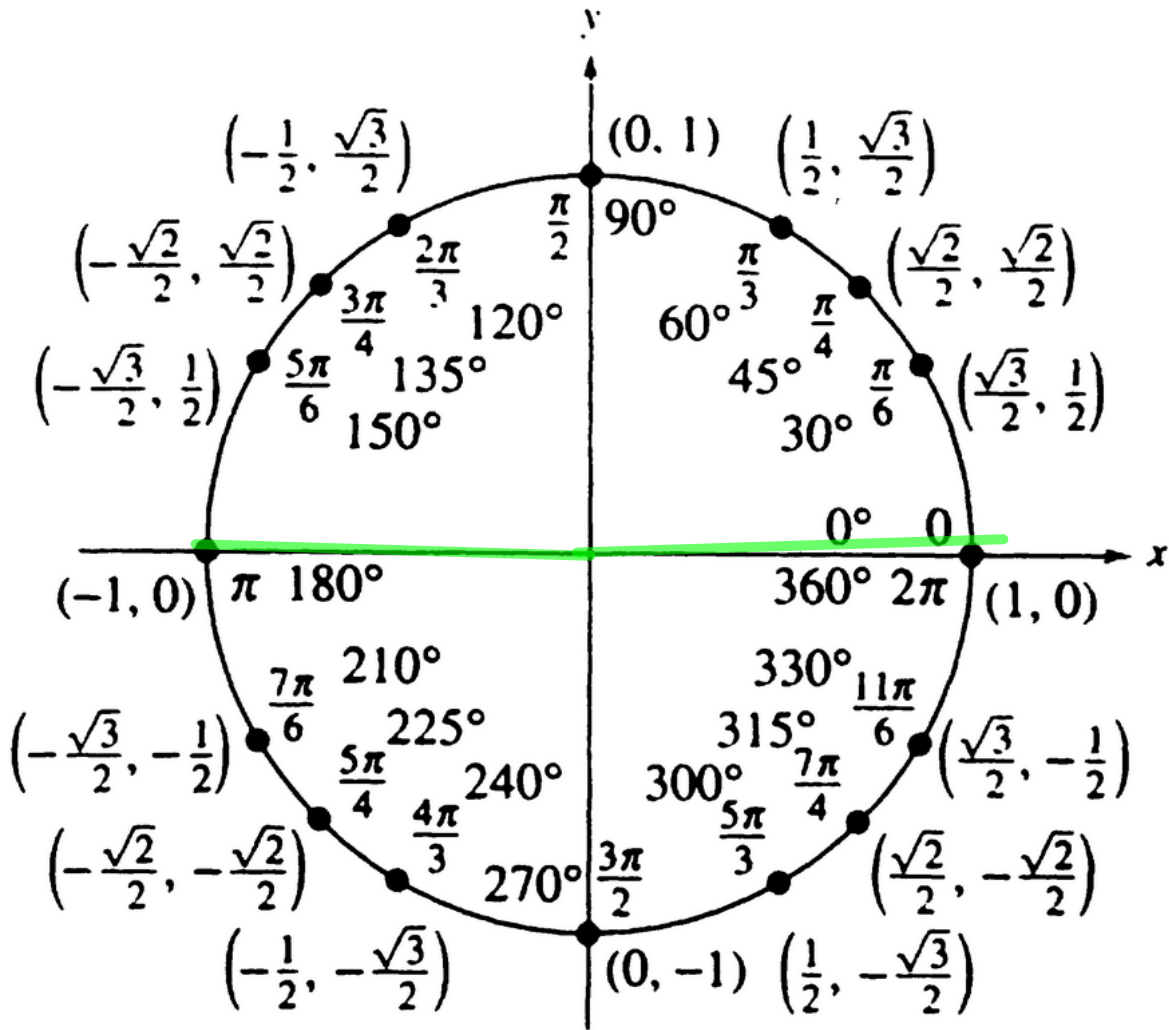
$$\sqrt{\sec^2 x} = \sqrt{1}$$

$$\sec x = \pm 1$$

$$\left(\cos x \right) = \frac{1}{\pm 1} = \begin{pmatrix} + \\ - \end{pmatrix} 1$$

$\swarrow \cos$
 $\swarrow \cos$

$$x = 0^\circ, 180^\circ$$



⑦

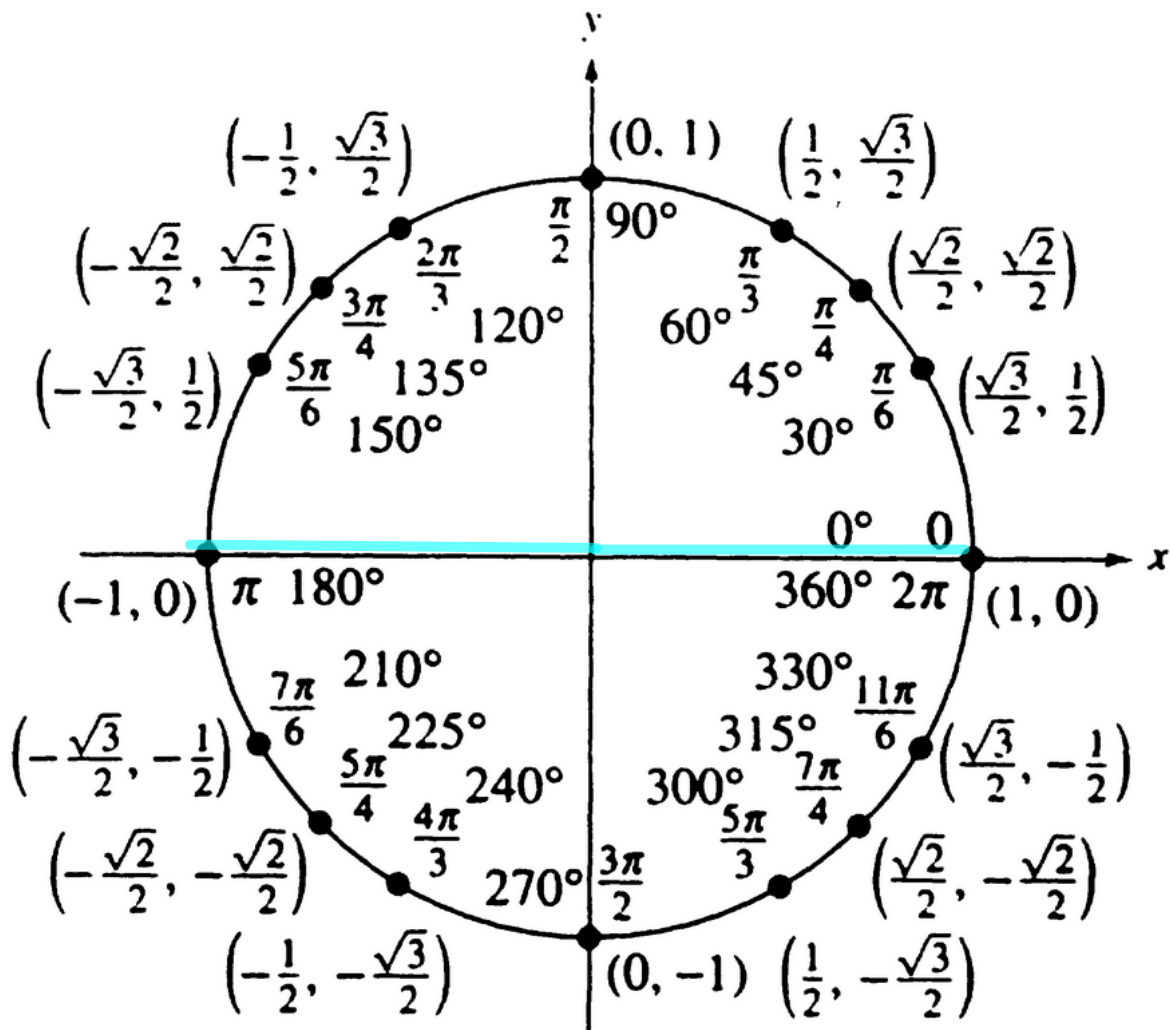
$$\sec^2 x - 1 = 0$$

$$\sqrt{\sec^2 x} = \sqrt{1}$$

$$\sec x = \pm 1$$

$$\cancel{\cos^{-1}}(\cos x) = \pm \frac{1}{1} = \left(\pm 1 \right) \cancel{\cos^{-1}}$$

$$X = 0, 180^\circ$$



You try!

$$1. \quad 3 \sec^2 x - 4 = 0$$

$$\begin{array}{r} \sec^2 x - 4 = 0 \\ \sec^2 x = 4 \\ \hline \sec x = \sqrt{\frac{4}{3}} \end{array}$$

$$\sec x = \frac{2}{\sqrt{3}} \rightarrow \cos x = \pm \frac{\sqrt{3}}{2}$$

$$x = 30, 150, 210, 330$$

Solve by factoring

$$\frac{\cancel{\text{csc}^4} x}{\cancel{\text{csc}^2} x} - 4 \frac{\cancel{\text{csc}^2} x}{\cancel{\text{csc}^2} x} = 0$$

2 trig
2 terms
E' thing = 0

$$\text{csc}^2 x (\text{csc}^2 x - 4) = 0 \quad \text{GCF}$$

$$\sqrt{\text{csc}^2 x} \neq 0$$

$$\text{csc} x = 0$$

$$\sin x = \frac{1}{0}$$

no solution

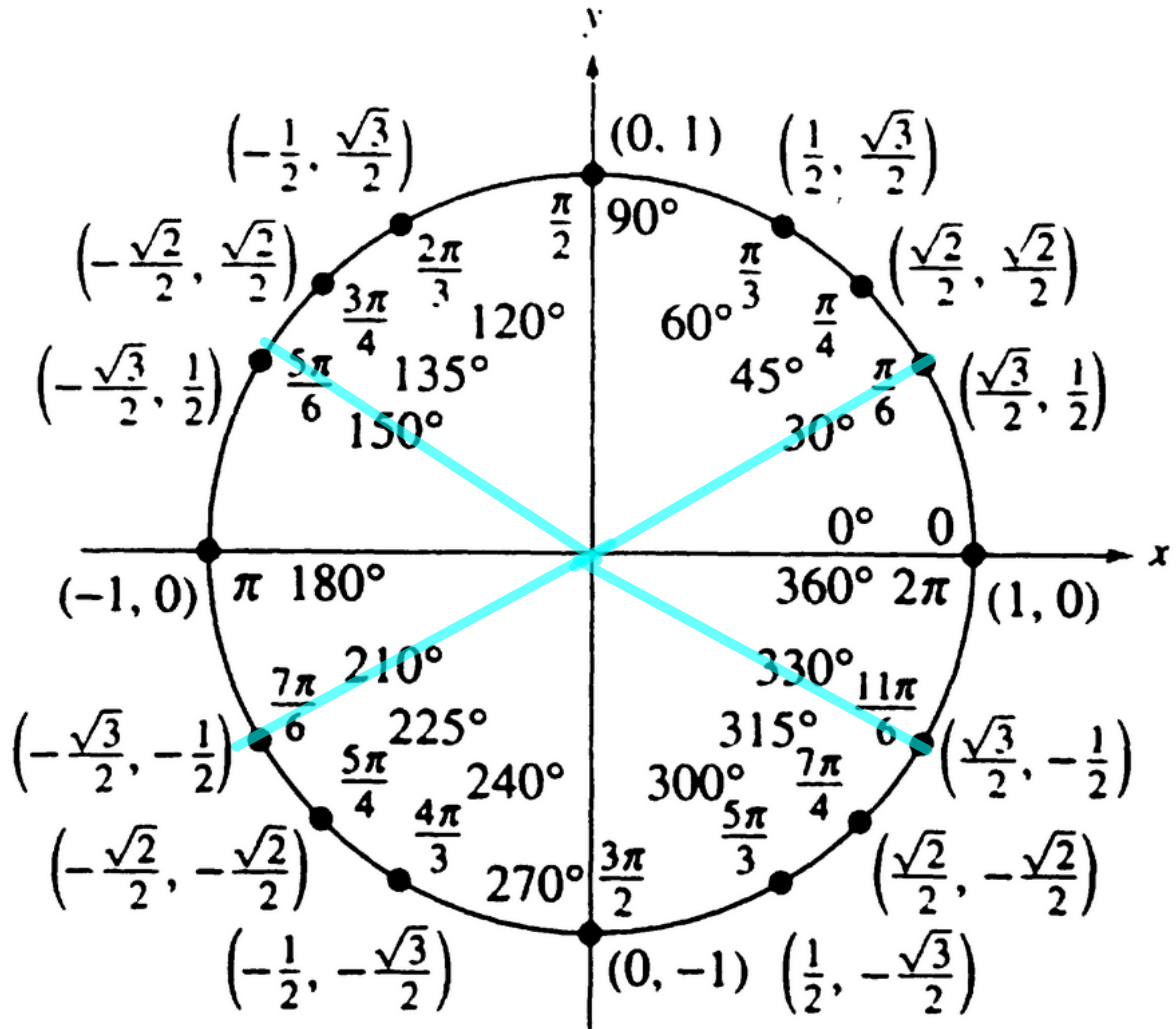
$$\text{csc}^2 x - 4 = 0$$

$$\frac{+4 \quad +4}{\sqrt{\text{csc}^2 x} = \pm 4}$$

$$\text{csc} x = \pm 2$$

$$\sin^{-1}(\sin x) = \sin^{-1}\left(\pm \frac{1}{2}\right)$$

$$X = 30^\circ, 150^\circ, 210^\circ, 330^\circ$$



$$\textcircled{14} \quad \sin^2 x \cos x = \cos x$$

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

$$\cos x (\sin^2 x - 1) = 0$$

$$\cos x = 0$$

$$x = 90^\circ, 270^\circ$$

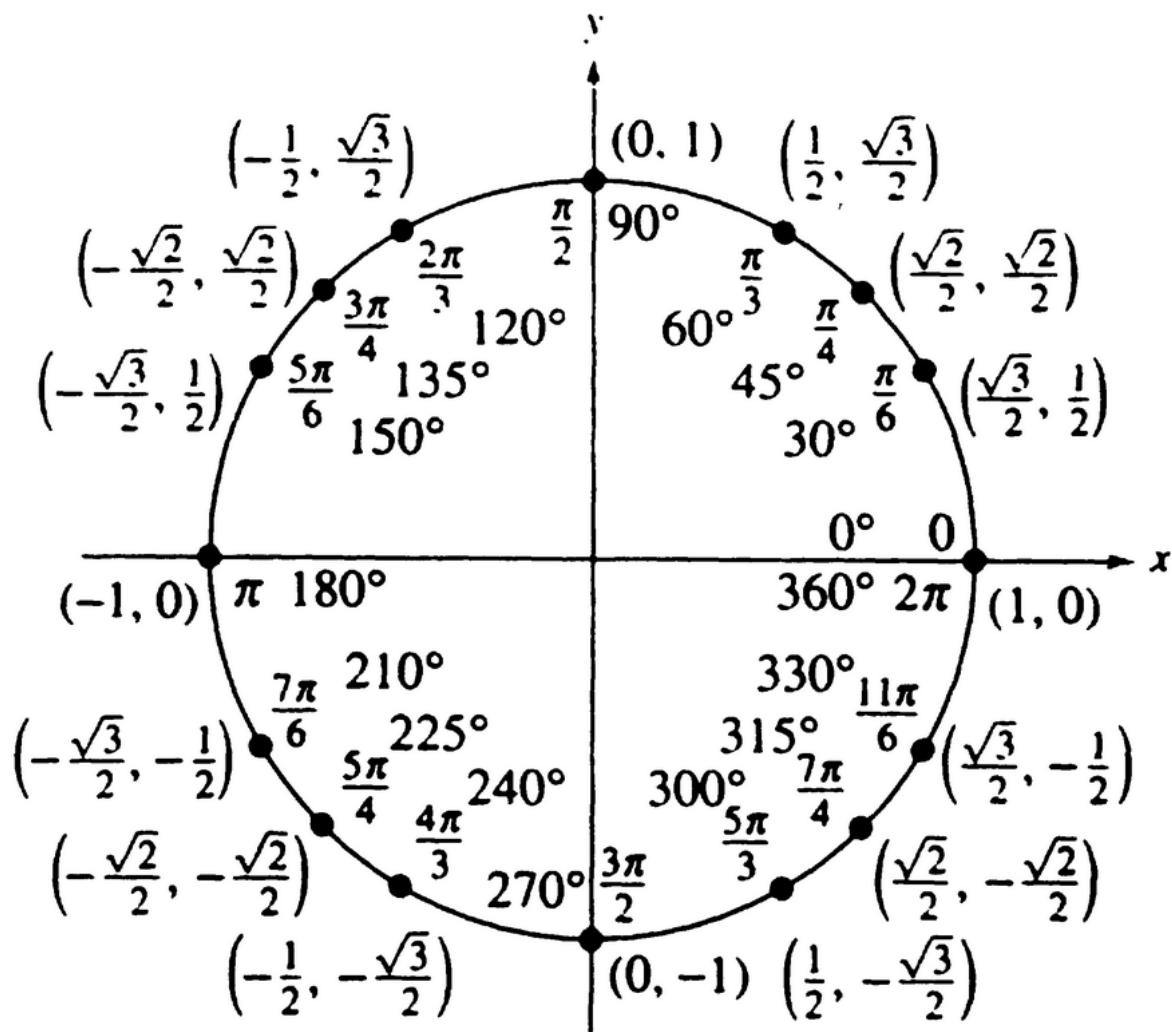
$$\sin^2 x - 1 = 0$$

$$\sqrt{\sin^2 x = 1}$$

$$\sin x = \pm 1$$

$$x = 90^\circ, 270^\circ$$

2 Solutions



You try!

$$2. \quad 2 \sin^2 x - \sin x = 0$$

$$\sin^2 x (2 \sin^2 x - 1) = 0$$

$$\sqrt{\sin^2 x} = \sqrt{0}$$

$\sin(\sin x = 0)$

$$X = 0, 180$$

$$2 \sin^2 x - 1 = 0$$

+1 +1

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

$$\sqrt{\sin^2 x} = \sqrt{\frac{1}{2}}$$

$$\sin x = \pm \frac{\sqrt{1}}{\sqrt{2}} = \pm \frac{1}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}}$$

$$\sin^{-1}(\sin x) = \left(\frac{+\sqrt{2}}{2} \right)$$

$$X = 45, 135, 225, 315$$

Quadratic type

$$2 \sin^2 x - \sin x - 1 = 0$$

2 trig
3 terms
AC method

$$(\sin x - 1)(2 \sin x + 1) = 0$$

$$\sin x - 1 = 0$$

+1 +1

$$\sin x = 1$$

\sin^{-1} \sin^{-1}

$$x = 90$$

$$2 \sin x + 1 = 0$$

-1 -1

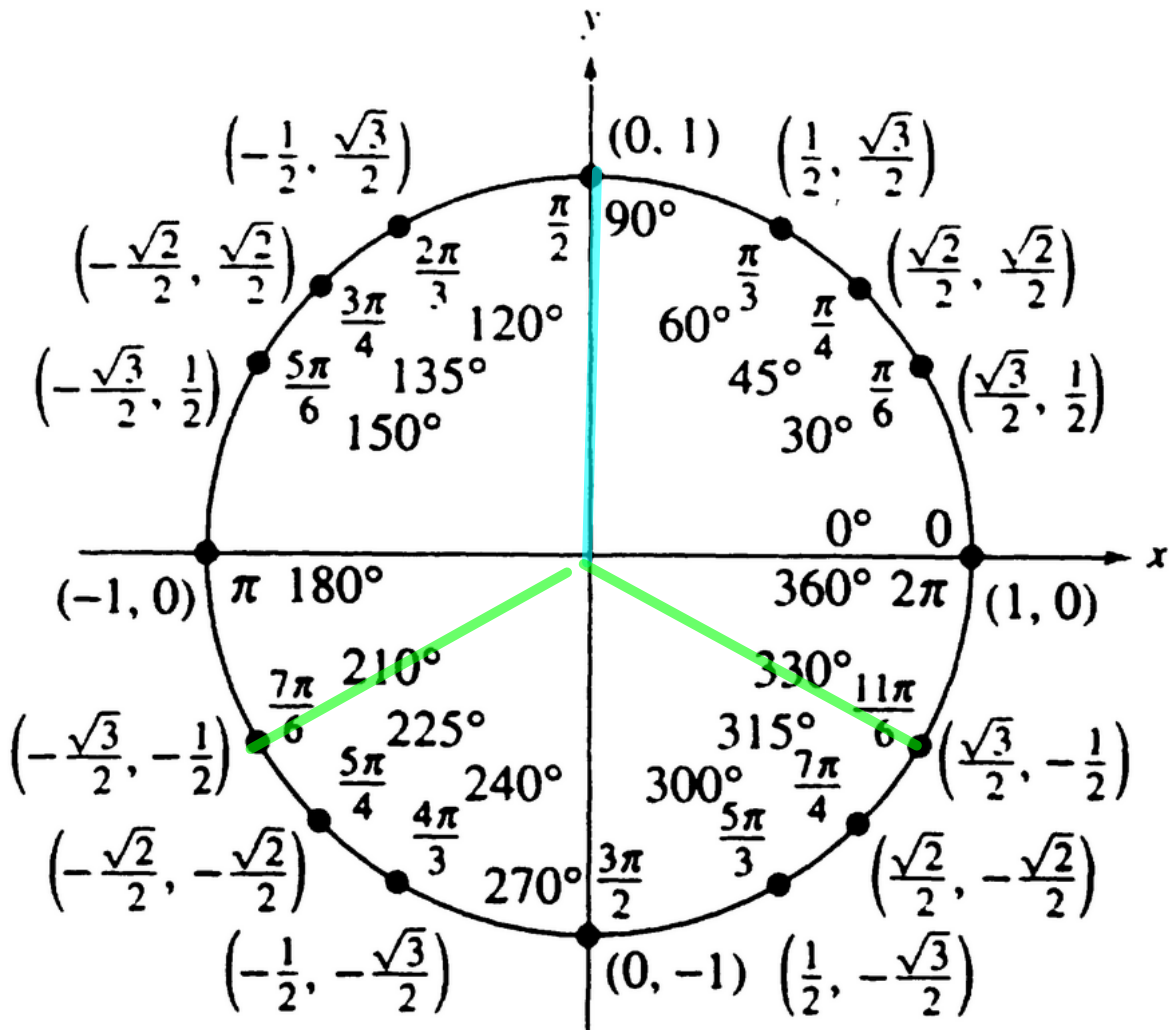
$$2 \sin x = -1$$

2 2

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

\sin^{-1} \sin^{-1}

$$x = 210, 330$$



$$2x^2 - x - 1 = 0$$

$$ax^2 + bx + c = 0$$

~~$$\begin{array}{r}
 a \cdot c \\
 -2 \\
 -2 \quad 1 \\
 -1 \\
 b
 \end{array}$$~~

Divide by a:

$$\begin{array}{l}
 (x - \frac{2}{2}) \quad (x + \frac{1}{2}) \\
 (x - 1) \quad (2x + 1)
 \end{array}$$

$$\textcircled{14} \quad \cot^2 x = -2 \cot x - 1$$

$+2 \cot x$ $+2 \cot x$

$$\cot^2 x + 2 \cot x = -1$$

$+1$ $+1$

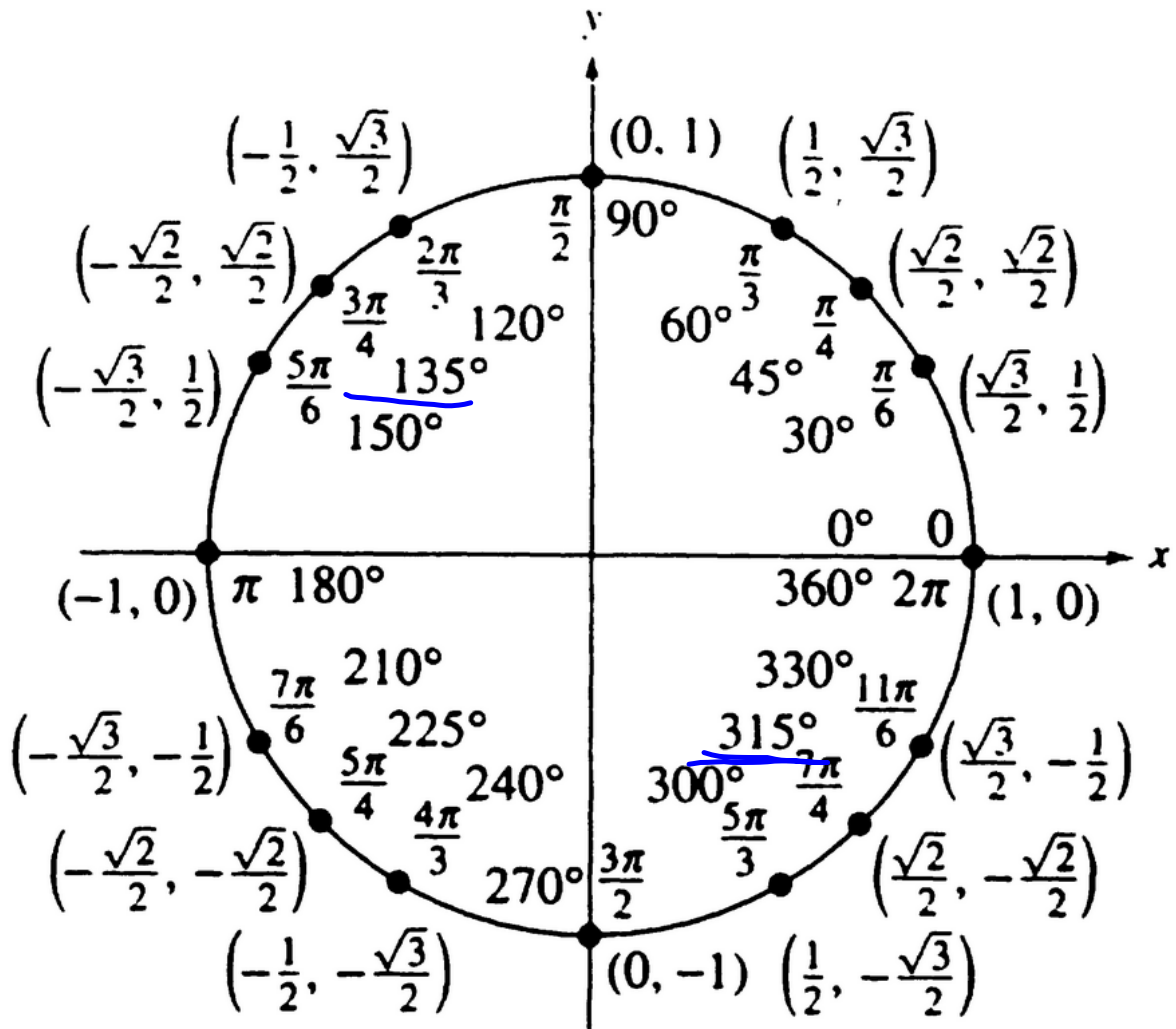
$$\cot^2 x + 2 \cot x + 1 = 0$$

$$\cot x + 1 = 0 \quad \cot x + 1 = 0$$

-1 -1

$$\cot x = \frac{-1}{1} = (-1)$$

$$x = 135^\circ, 315^\circ$$



$$2x^2 - x - 1 = 0$$

$$ax^2 + bx + c = 0$$

Divide by a

$a \cdot c$	-2
-2	1
-1	1
b	1

$(x-2)(x+1)$
 $(x-1)(2x+1)$

$$2x^2 - x - 1 = 0$$

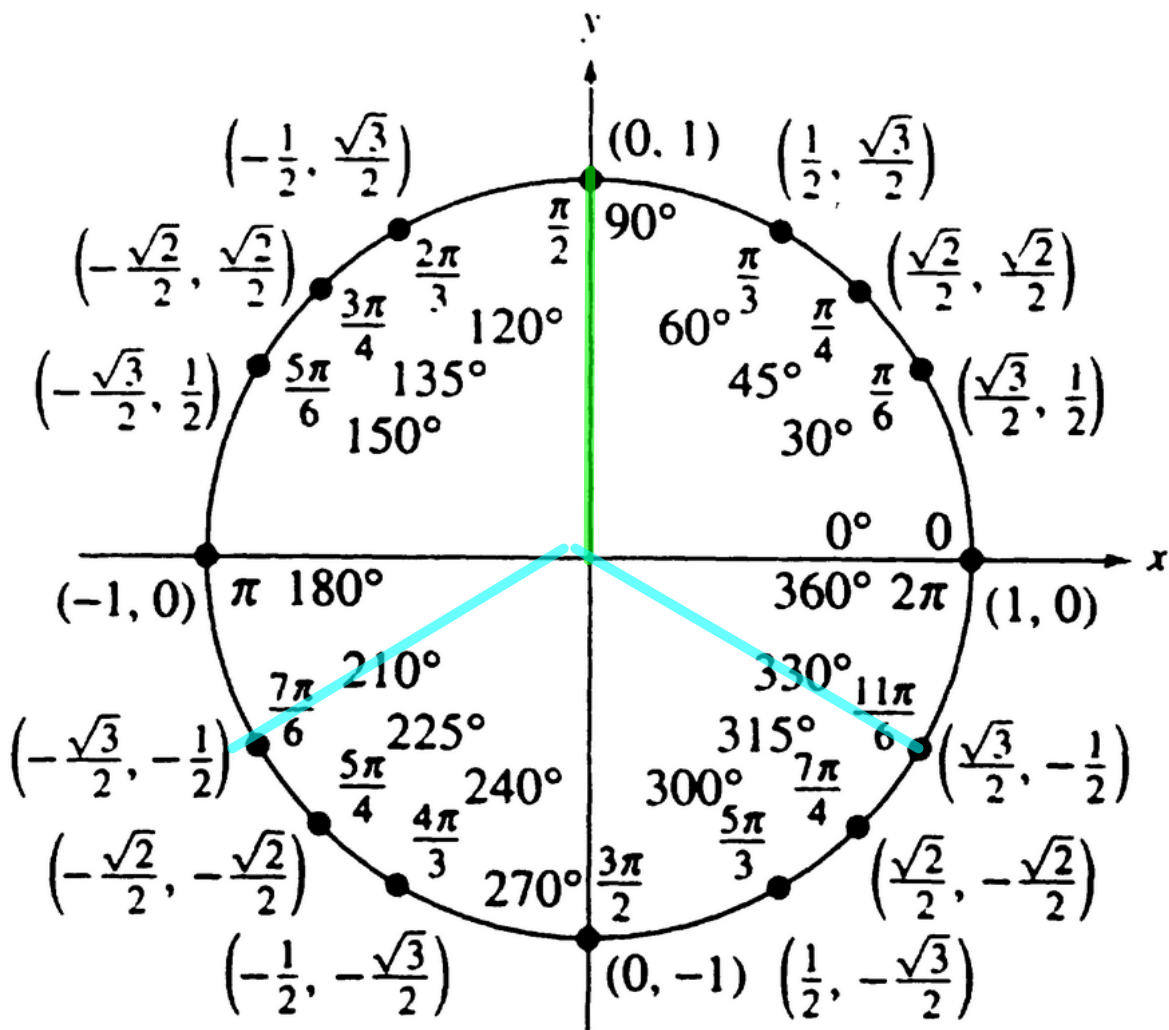
$ax^2 + bx + c$

$$\begin{array}{r}
 a \cdot c \\
 -2 \\
 -2 \quad 1 \\
 -1 \\
 b
 \end{array}$$

Divide by 2

$$\left(x - \frac{1}{2} \right) \left(x + \frac{1}{2} \right)$$

$$(x-1)(2x+1) = 0$$



$$17 \cot^2 x = -2 \cot x - 1$$

$$+ 2 \cot x + 1$$

$$\cot^2 x + 2 \cot x + 1 = 0$$

$$(\cot x + 1)(\cot x + 1) = 0$$

$$\cot x + 1 = 0$$

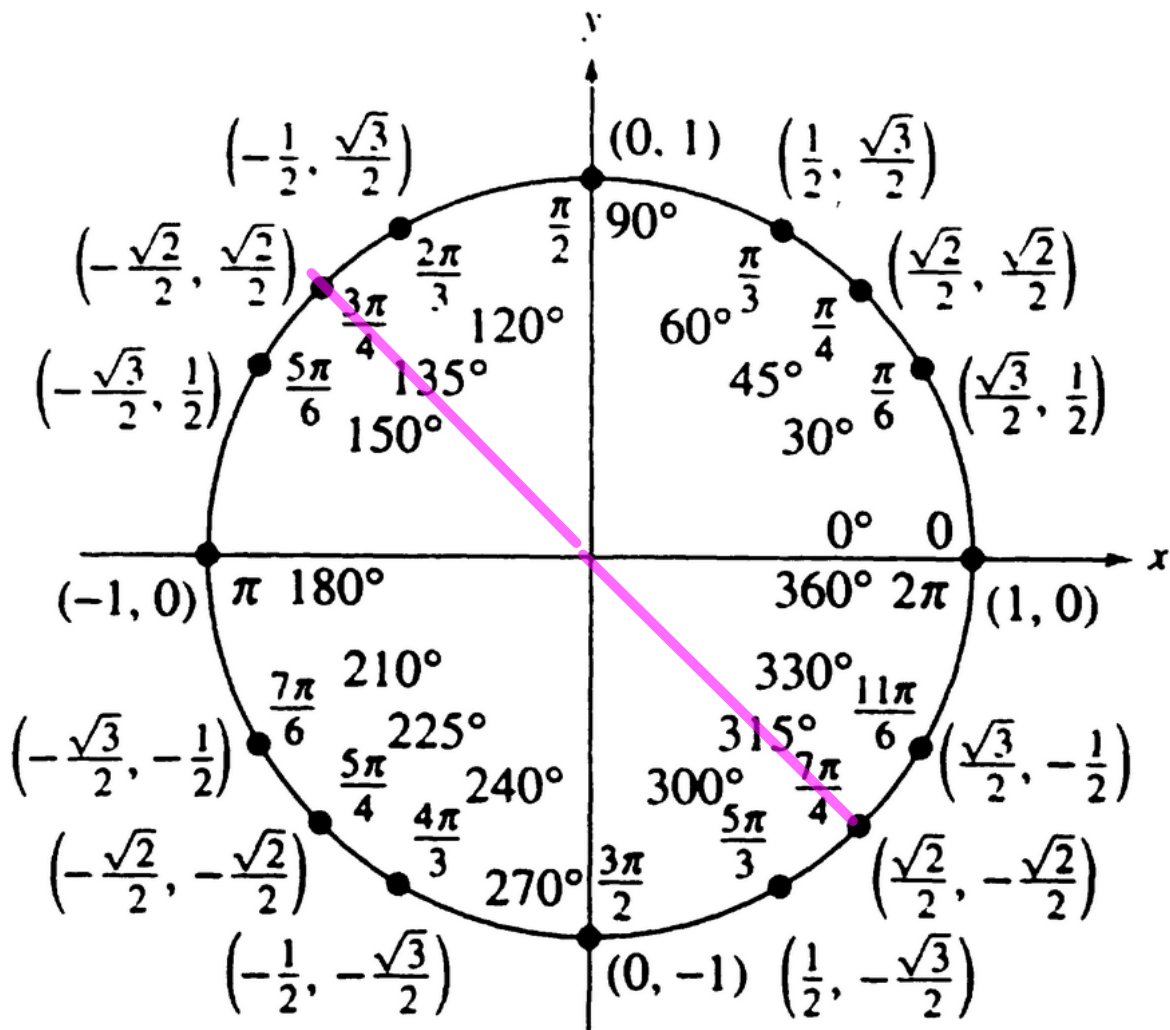
$$\frac{-1 \quad -1}{\quad}$$

$$\cot x = -1$$

$$x = 135^\circ \text{ \& } 315^\circ$$

A.C
~~1~~
~~2~~
 B
 x & y
 both same
 1 Neg

$$\tan x = -\frac{1}{1} = -1$$



You try!

3. $2 \cot^4 x - \cot^2 x - 15 = 0$

17

$$\cot^2 x = -2\cot x - 1$$

2 trig terms

$$+2\cot x + 1$$

$$+2\cot x + 1$$

$$\cot^2 x + 2\cot x + 1 = 0$$

$$(\cot x + 1)(\cot x + 1) = 0$$

$$\cot x + 1 = 0$$

$$\begin{array}{r} -1 \quad -1 \\ \hline \end{array}$$

$$\cot x = -1$$

$$\cancel{\tan x} = \cancel{(-1)}$$

$\tan^{-1}(-1)$

$$x = 135^\circ, 315^\circ$$

$$\cot^2 x + 2 \cot x + 1 = 0$$

$$x^2 + 2x + 1 = 0$$

a.c

~~$$\begin{array}{c} 1 \\ 1 \\ 2 \\ b \end{array}$$~~

Divide by a!

$$(x + \frac{1}{1})(x + \frac{1}{1})$$

$$(x + 1)(x + 1)$$

