14-4 Solving Trig Equations

trig. std. 4.0

recall:

Q2	Q1
sin +	all +
tan +	cos +
Q3	Q4

note: $\cos^2 x = (\cos x)^2$

$\tan x = \frac{\sin x}{\cos x}$, $\cot x = \frac{\cos x}{\sin x}$

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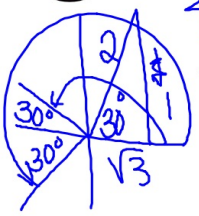
examples: Solve over the interval $0 \le x < 2\pi$

ex. 1 $4\cos^2 x - 3 = 0$

$4y^2 - 3 = 0$



$4\cos^2 x = 3$

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

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

Q1 Q2 Q3 Q4

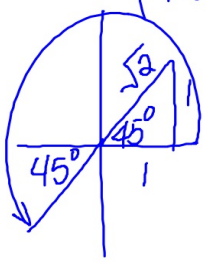
$30°, 150°, 210°, 330°$

$\frac{\pi}{6}, \frac{5\pi}{6}, \frac{7\pi}{6}, \frac{11\pi}{6}$

ex. 2 $\tan^2 x - 2\tan x + 1 = 0$

$y^2 - 2y + 1 = 0$

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



$\tan x - 1 = 0$

$\tan x = 1$

$x = 45°, 225°$

$\frac{\pi}{4}, \frac{5\pi}{4}$

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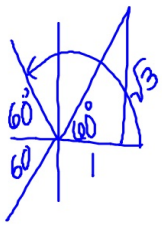
ex. 3 $\cot^2 x = \frac{1}{3}$

$\tan^2 x = 3$



$\tan x = \pm\sqrt{3}$

Q1 Q2 Q3 Q4

$x = 60°, 120°, 240°, 300°$

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

ex. 4 $\sin^2 x = 2\sin x$

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

$y^2 - 2y = 0$

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

$\sin x = 0$ $\quad$ $\sin x = 2$

$x = 0$ $\quad$ NO SOLN

$0, \pi$