14-4 Solving Trig Equations

trig. std. 4.0

recall:

Q2	Q1
Sin + csc +	All +
tan + cot +	cos + sec +
Q3	Q4

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

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

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

$4y^2 - 3 = 0$

$4\cos^2 x = 3$

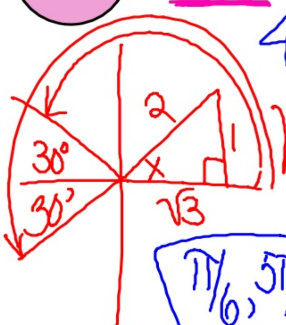
$\sqrt{\cos^2 x} = \sqrt{\frac{3}{4}}$

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

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

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

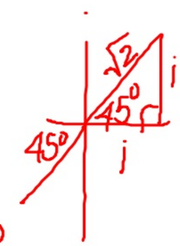
$(\tan x - 1)^2 = 0$

$\tan x = 1$

Q1, Q3

45°, 225°

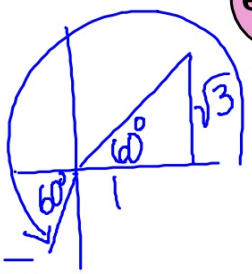
$\frac{\pi}{4}, \frac{5\pi}{4}$



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

$\cot x = \frac{\pm 1}{\sqrt{3}}$

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



+ Q1 − Q2 + Q3 − Q4

$60°, 120°, 240°, 300°$

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

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

$y^2 - 2y = 0$

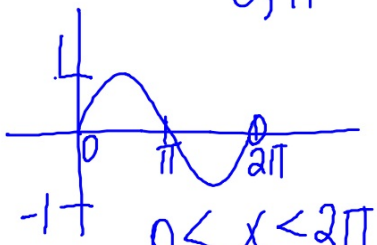
$\sin^2 x - 2\sin x = 0$

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

$\sin x = 0$ $\qquad$ $\sin x = 2$

$x = 0°$ $\qquad$ no solution

$0, \pi$



$0 \le x < 2\pi$