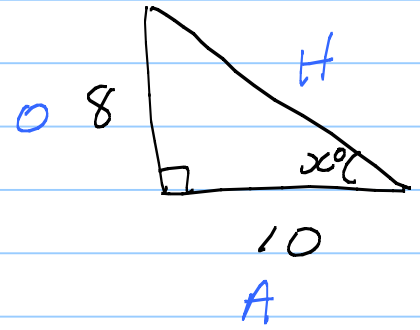
SOLVING TRIG EQUATIONS

Note Title 12/11/2012

REVIEW:



$\tan\theta = \frac{O}{A}$

$\tan x = \frac{8}{10}$

$\tan x = .8$

$\tan^{-1} .8 = 38.6^\circ$

STRATEGIES FOR SOLVING

(1) SOLVE FOR $\sin x$, $\cos x$ OR $\tan x$

(2) DETERMINE WHICH QUADRANT THE ANGLE(S) ARE IN.

* REMEMBER "ALL STUDENTS TAKE CALCULUS" (ASTC)

(3) MAKE SURE IN CORRECT MODE

(4) FIND THE REFERENCE ANGLE

(5) DETERMINE YOUR ANSWERS.

EG

SOLVE $4\sin x + 3 = 0$ $0^\circ \leq x < 360^\circ$

SOLN $4\sin x + 3 = 0$

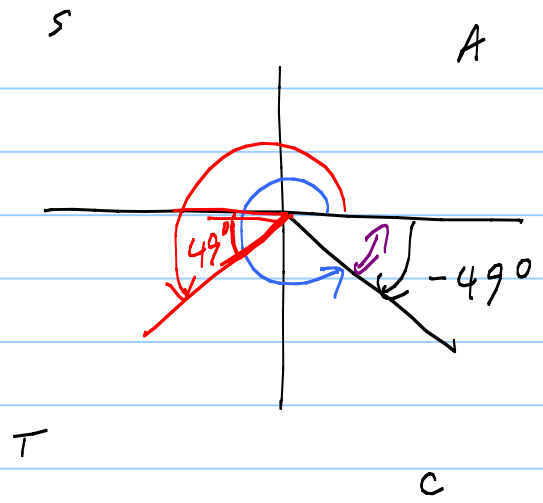
$-3 \quad -3$

$\frac{4\sin x}{4} = \frac{-3}{4}$

$\sin x = -\frac{3}{4}$

$\sin x = -0.75$

$\sin^{-1} -0.75 = -49^\circ$



$x_1 = 360 - 49$

$x_1 = 311^\circ$

$x_2 = 180 + 49$

$x_2 = 229^\circ$

IE SOLVE $3\cos x - 2 = 0$ $0^\circ \leq x < 360^\circ$

SOLN $3\cos x - 2 = 0$

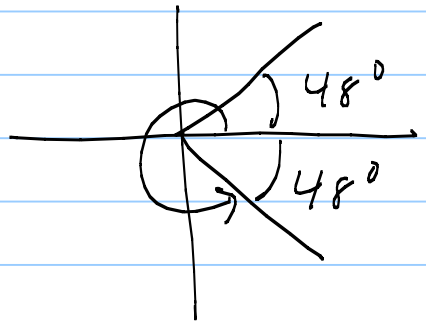
$+2 \quad +2$

$3\cos x = 2$

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

$\cos x = .6667$

$\cos^{-1} .6667 = 48°$



$x_1 = 48°$

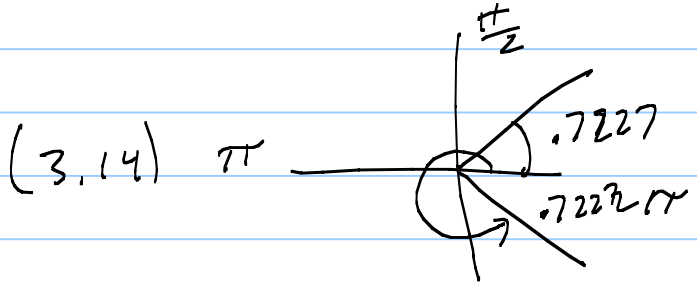
$x_2 = 360 - 48$

$= 312°$

10 SOLVE $4\cos x - 3 = 0$ $\quad 0 \le x < 2\pi$

SOLN $\quad \cos x = \frac{3}{4}$

$\cos^{-1} .75 = .7227$



$x_1 = .7227$

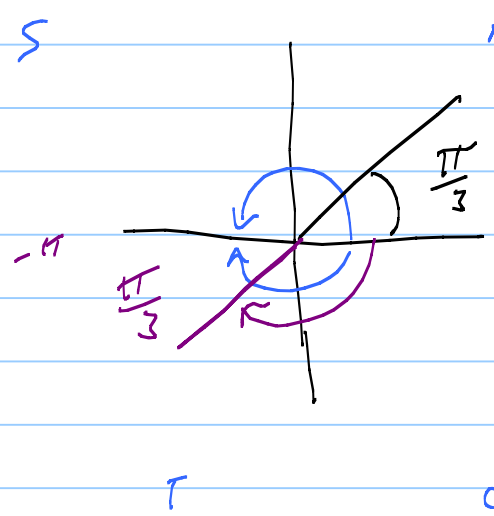
$x_2 = 2\pi - .7227$

$\frac{3\pi}{2}$ $\qquad x_2 = 5.56$

* EXACT VALUES *

EX SOLVE $\tan x = \sqrt{3}$ $\qquad -\pi \leq x < \pi$

SOLN $\qquad x_1 = \frac{\pi}{3}$



$x_2 = -\pi + \frac{\pi}{3}$

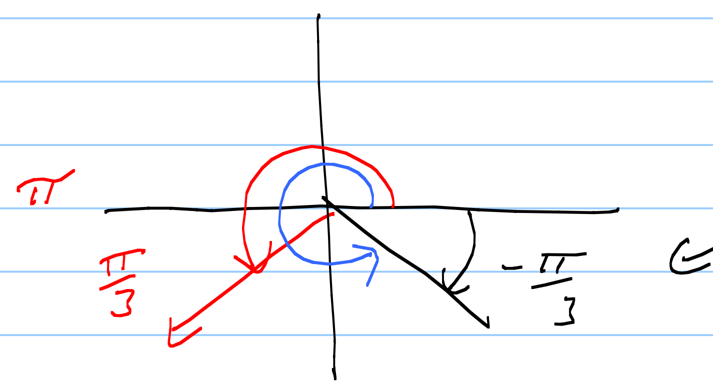
$x_2 = -\frac{2\pi}{3}$

$x_2 = -\frac{3\pi}{3} + \frac{\pi}{3}$

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

IE   SOLVE $\sin x = \frac{-\sqrt{3}}{2}$ $0 \le x < 2\pi$

SOLN $x = -\frac{\pi}{3}$



$x_1 = 2\pi - \frac{\pi}{3}$

$x_1 = \frac{6\pi}{3} - \frac{\pi}{3}$

$x_1 = \frac{5\pi}{3}$

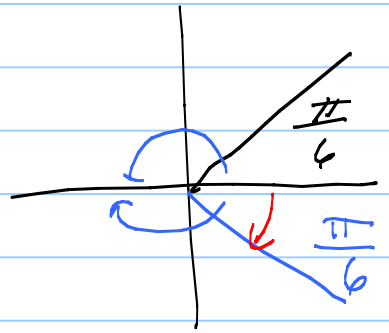
$x_2 = \pi + \frac{\pi}{3}$

$x_2 = \frac{3\pi}{3} + \frac{\pi}{3}$

$x_2 = \frac{4\pi}{3}$

IE $\sec x = \frac{2}{\sqrt{3}}$ $\quad -\pi \le x < \pi$

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



$x_1 = \frac{\pi}{6}$

$x_2 = -\frac{\pi}{6}$

H/W p/4 45 SECT 6.6 #1-5