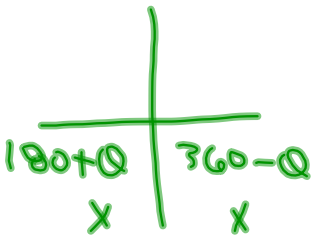
WARM-UP:

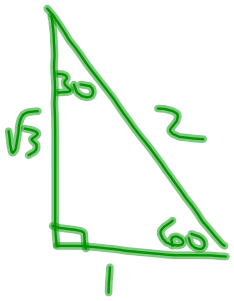
Solve:

(1) $2\sin\theta = -\sqrt{3}, \quad -360^\circ \le \theta \le 720^\circ$

$\sin\theta = -\frac{\sqrt{3}}{2}$

(Ref $\angle 60^\circ$, Q3, 4)





$\theta = 240^\circ, 300^\circ, 600^\circ, 660^\circ, -120^\circ, -60^\circ$

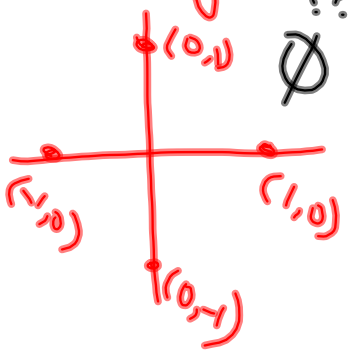
(2) $\csc\theta(\sec\theta + 1) = 0, \quad 0 \le \theta \le 4\pi$

$\csc\theta = 0$ OR $\sec\theta + 1 = 0$

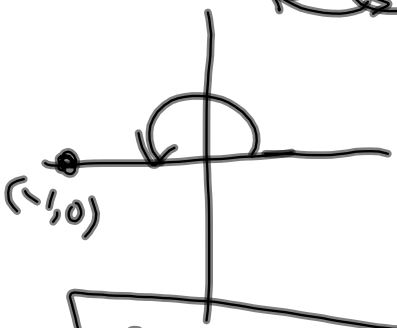
$\sec\theta = -1$

$\csc\theta = \frac{r}{y} = \frac{1}{??} = 0$

$\varnothing$



$\sec\theta = \frac{r}{x} = \frac{1}{-1}$



$\theta = \pi, 3\pi$

Solve: $5\sin^2\theta + 3\sin\theta = 2, \quad -360° \le \theta \le 360°$

$m = \sin\theta$

$5m^2 + 3m = 2$

$5m^2 + 3m - 2 = 0$

FACTOR

$5m^2 + 5m - 2m - 2 = 0$

$5m(m+1) - 2(m+1) = 0$

$(m+1)(5m-2) = 0$

$m+1=0 \qquad 5m-2=0$

$m = -1 \qquad 5m = 2$

$m = \frac{2}{5}$

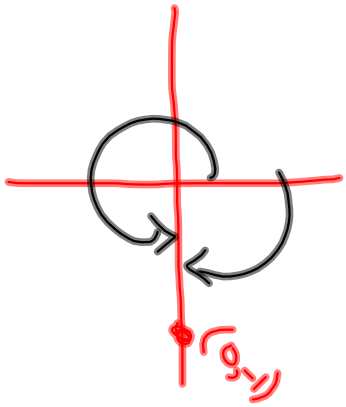
QUADRATIC FORMULA

$m = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

$\sin\theta = -1$

$\sin\theta = \frac{y}{r} = \frac{-1}{1}$

$y = -1$



$\theta = 270°, -90°$

$\sin^{-1}\left(\frac{2}{5}\right) \quad \sin\theta = \frac{2}{5}$ (+), $180° - \theta$ (x), θ (x)

(Ref $\measuredangle$ 24°, Q 1, 2)

$\theta = 24°, 156°, -336°, -204°$

General Solution of a Trigonometric Equation

Solve: $3\cos^2\theta - \cos\theta = 2;\ \theta \in \mathbb{R}$

$3\cos^2\theta - \cos\theta - 2 = 0$ (−6)

$3\cos^2\theta - 3\cos\theta + 2\cos\theta - 2 = 0$

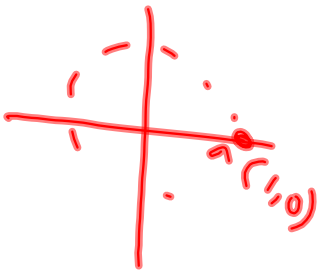
$3\cos\theta(\cos\theta - 1) + 2(\cos\theta - 1) = 0$

$(\cos\theta - 1)(3\cos\theta + 2) = 0$

$\cos\theta = 1$ OR $\cos\theta = -\frac{2}{3}$

$\cos\theta = \frac{x}{r}$ (1) (1)

$x = 1$



$\theta = 0° + 360°k, k \in I$

OR $\theta = \theta \pm 360°k, k \in N$

(Ref ∠ 48°, Q 2,3)

$\theta = 132° + 360°k, k \in I$

$\theta = 228° + 360°k, k \in I$

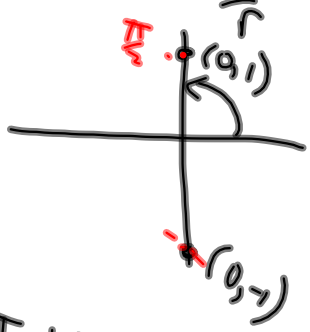
Determine the general solution for $\sin^2 x - 1 = 0$ over the real numbers if x is measured in radians.

$\sin^2 x - 1 = 0$

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

$\sin x = 1 \qquad \sin x = -1$

$\sin\theta = \frac{y}{r}$



$x = \frac{\pi}{2} + 2\pi k, k \in I$

$x = \frac{3\pi}{2} + 2\pi k, k \in I$

Did You Know?

$2n$, where $n \in \mathrm{I}$, represents all even integers.

$2n + 1$, where $n \in \mathrm{I}$, is an expression for all odd integers.

$x = \frac{\pi}{2} + 2\pi n$, where $n \in \mathrm{I}$

$x = \frac{3\pi}{2} + 2\pi n$, where $n \in \mathrm{I}$

or

$x = \frac{\pi}{2} + \pi n$, where $n \in \mathrm{I}$

or

$(2n + 1)\left(\frac{\pi}{2}\right)$, $n \in \mathrm{I}$

odd Integers

Linear Trigonometric Equations....

Page 211
#3, 4, 5

Practice Problems:

Pages 212 - 214
#7 - 23