

## 7.2b Solving 2nd order trig equations

Note Title

03/12/2012

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

Let  $\sin x = a$

$$2a^2 - a - 1 = 0$$

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

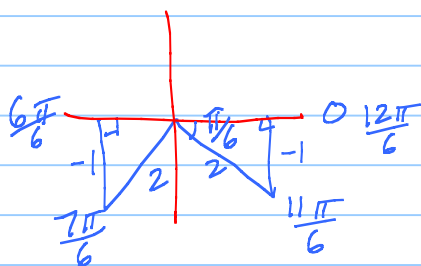
$$2a(a-1) + 1(a-1) = 0$$

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

$$a = -\frac{1}{2}, 1$$

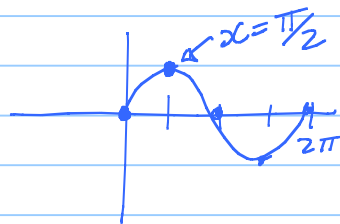
$$\therefore \sin x = -\frac{1}{2}, 1$$

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



$$x = \frac{7\pi}{6} + 2\pi n, \frac{11\pi}{6} + 2\pi n, \frac{\pi}{2} + 2\pi n, n \in \mathbb{Z}$$

$$\sin x = 1$$



Solve  $2\csc^2 x - 5\csc x + 2 = 0, 0 \leq x < 360^\circ$

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

$$(2a-1)(a-2) = 0$$

$$a = \frac{1}{2}, 2$$

$$\csc x = \frac{1}{2}, 2$$

$$\csc x = \frac{1}{2}$$

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

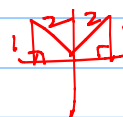
$$\sin x = 2$$

No solution!

$$\csc x = 2$$

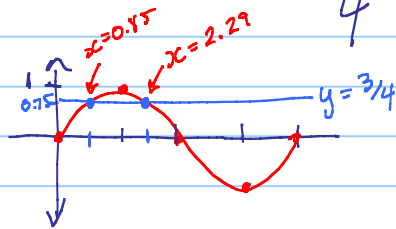
$$\frac{1}{\sin x} = \frac{2}{1}$$

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



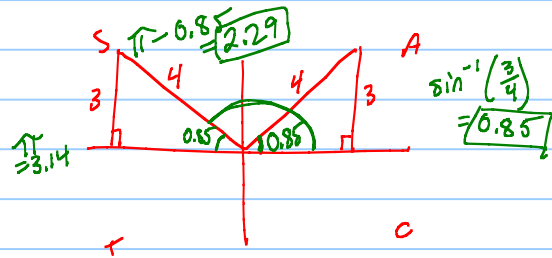
$$x = 30^\circ, 150^\circ$$

Solve  $\sin x = \frac{3}{4}$  to 2 decimals.



$$y_1 = \sin x$$

$$y_2 = 3/4$$



$$x = 0.85 + 2\pi n, 2.29 + 2\pi n, \quad n \in \mathbb{Z}$$