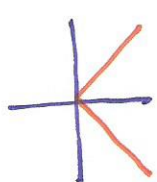


5. (10 points) Solve the following equations.

a. $2\cos x - \sqrt{2} = 0, \quad 0 \leq x < 2\pi$

$\cos x = \frac{\sqrt{2}}{2}$ (+2)



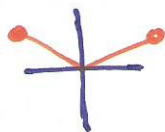
$x = \frac{\pi}{4}, \frac{7\pi}{4}$ (+2)

b. $2\sin^2 x - \sin x = 0, \quad \text{all real } x$

$\sin x (2\sin x - 1) = 0$ (+1)

$\sin x = 0$

$\sin x = \frac{1}{2}$ (+2)

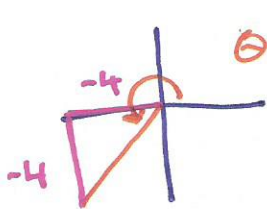


$x = \frac{\pi}{6} + 2k\pi$
 $x = \frac{5\pi}{6} + 2k\pi$ (+2)

$x = 0 + k\pi$ or just $k\pi$ (+1)

6. (10 points) Convert the following using exact values.

a. Convert the point $(-4, -4)$ to polar coordinates.



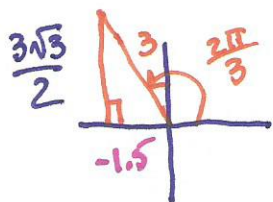
$\theta = \frac{5\pi}{4}$ (+1)

or $\tan \theta = \frac{-4}{-4} = 1 \quad \tan^{-1}(+1) = \frac{\pi}{4}$ because it's not defined in III so $\frac{5\pi}{4}$

$\sqrt{(-4)^2 + (-4)^2} = \sqrt{32} = 4\sqrt{2}$ (+1)

$(4\sqrt{2}, \frac{5\pi}{4})$ (+3)

b. Convert the point $(3, \frac{2\pi}{3})$ to rectangular coordinates.



$x: \cos \frac{2\pi}{3} = \frac{x}{3} \rightarrow 3\cos \frac{2\pi}{3} = x = -1.5$ (+1)

$y: \sin \frac{2\pi}{3} = \frac{y}{3} \rightarrow 3\sin \frac{2\pi}{3} = y = \frac{3\sqrt{3}}{2}$ (+1)

$(-\frac{3}{2}, \frac{3\sqrt{3}}{2})$ (+3)