

Name: _____

Problem 1. [5 points] Find all solutions on $[0, 2\pi)$ for

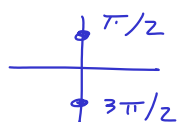
$$\cot x \cos^2 x = 2 \cot x$$

$$\cot x \cos^2 x - 2 \cot x = 0$$

$$\cot x (\cos^2 x - 2) = 0$$

$$\cot x = 0 \quad \text{or} \quad \cos x = \pm\sqrt{2}$$

DNE



$$x = \frac{\pi}{2}, \frac{3\pi}{2}$$

Problem 2. [5 points] Find the general solution to

$$2 \sin^2 x - 3 \cos x = 3$$

$$2 - 2 \cos^2 x - 3 \cos x = 3$$

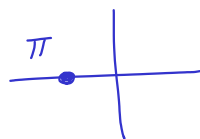
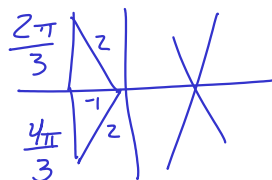
$$0 = 2 \cos^2 x + 3 \cos x + 1$$

$$0 = 2 \cos^2 x + 2 \cos x + \cos x + 1$$

$$0 = (2 \cos x + 1) (\cos x + 1)$$

$$\cos x = -\frac{1}{2} \quad \text{or} \quad \cos x = -1$$

$$\begin{array}{r} 2 \\ \times 1 \\ \hline 2 \\ + 3 \\ \hline 5 \end{array}$$

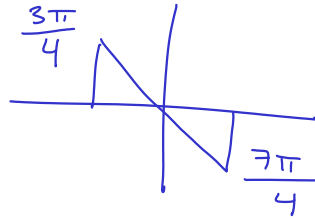


$$\begin{aligned} x &= \frac{2\pi}{3} + 2\pi n \\ x &= \frac{4\pi}{3} + 2\pi n \\ x &= \pi + 2\pi n \end{aligned}$$

Problem 3. [5 points] Find all solutions on $[0, 2\pi)$ for:

$$3\tan(2x) + 3 = 0$$

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



$$2x = \frac{3\pi}{4} + \pi n$$

$$x = \frac{3\pi}{8} + \frac{\pi}{2} n$$

$$x = \frac{3\pi}{8}, \frac{7\pi}{8}, \frac{11\pi}{8}, \frac{15\pi}{8}$$