Warm-up 7: Solving Equations

Solve over $[0, 2\pi)$.

1. $\cos x \sin x = 3\cos x$

$0 = 3\cos x - \cos x \sin x$

$0 = \cos x (3 - \sin x)$

$\cos x = 0 \qquad 3 - \sin x = 0$

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

Not possible

2. $2\cos^2 x = -\cos x + 1$

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

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

$2\cos x - 1 = 0 \qquad \cos x + 1 = 0$

$2\cos x = 1 \qquad \cos x = -1$

$\cos x = \frac{1}{2} \qquad x = \pi$

$x = \frac{\pi}{3}, \frac{5\pi}{3}$