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Warm-up: Solving Equations

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

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

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

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

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

~~$3 = \sin x$~~

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

2. ~~$\sin^2 x + \sin x + 2$~~ $2\cos^2\theta = -\cos\theta + 1$

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

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

$\cos\theta = \frac{1}{2} \qquad \cos\theta = -1$

$\theta = \frac{\pi}{3}, \frac{5\pi}{3} \qquad \theta = \pi$