# 5.3 Solving Trig Eqns (continued)

ex: Solve $2\sin^2 x + 3\cos x - 3 = 0$ for $[0, 2\pi)$.

Rewrite eqn in terms of cos only.

$\sin^2 x = 1 - \cos^2 x$

$2(1 - \cos^2 x) + 3\cos x - 3 = 0$

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

$(-1)(-2\cos^2 x + 3\cos x - 1) = (0)(-1)$

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

$u = \cos x$

$2u^2 - 3u + 1 = 0$

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

$2u - 1 = 0$ $\quad$ $u - 1 = 0$

$u = \frac{1}{2}$ $\quad$ $u = 1$

$\cos x = \frac{1}{2}$ $\quad$ $\cos x = 1$

$\boxed{x = \frac{\pi}{3}, \frac{5\pi}{3}}$ $\quad$ $\boxed{x = 0}$

ex: Solve $\sin(2x) - \frac{\sqrt{3}}{2} = 0$ for all values of $x$.

$\sin u - \frac{\sqrt{3}}{2} = 0$ $\quad u = 2x$

$+\frac{\sqrt{3}}{2} \quad +\frac{\sqrt{3}}{2}$

$\sin u = \frac{\sqrt{3}}{2}$

$u = \frac{\pi}{3} + 2\pi n$ $\qquad u = \frac{2\pi}{3} + 2\pi n$

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

$x = \frac{\pi}{3} \cdot \frac{1}{2} + \pi n$ $\qquad x = \frac{2\pi}{3} \cdot \frac{1}{2} + \pi n$

$\boxed{x = \frac{\pi}{6} + \pi n}$ $\qquad \boxed{x = \frac{\pi}{3} + \pi n}$

$\frac{\pi}{3} \div \frac{2}{1}$

$\frac{\pi}{3} \cdot \frac{1}{2}$