WARMUP - Solve by factoring:

1) $x^2 - 4 = 0$

$(x+2)(x-2) = 0$

$x+2=0$ $\quad x-2=0$

$x=-2$ $\quad x=2$

2) $4x^2 - 1 = 0$ → $(2x+1)(2x-1)=0$

$2x+1=0$ $\quad 2x-1=0$

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

3) $x^2 - 3x - 4 = 0$

$(x-4)(x+1)=0$

$x=4$ $\quad x=-1$

-4, 1, -4, -3

4) $2x^2 - 3x - 2 = 0$ → $(2x+1)(x-2)$

$2x$, x, $-4x$

$2x+1=0$ $\quad x-2=0$

$2x=-1$ $\quad x=2$

$x=-\frac{1}{2}$

5) $3x^2 + 4x + 1 = 0$

$2x$, -4, $2x$, 1, -4, -3

$(3x+1)(x+1)=0$

$3x+1=0$ $\quad x+1=0$

$x=-\frac{1}{3}$ $\quad x=-1$

Section 6.8 Solving Trig Equations Part 2

ex: Solve on $0 \le \theta < 2\pi$

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

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

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

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

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

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

$(2x-1)(x+1)$

$-x$, $2x$

ex: Solve for $0 \le \theta < 2\pi$

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

$$1 - \sin^2\theta - \sin^2\theta + \sin\theta = 0 \quad \leftarrow \text{get eq. to have sine}$$

$$(-1)\left(-2\sin^2\theta + \sin\theta + 1\right) = 0(-1)$$

$$2\sin^2\theta - \sin\theta - 1 = 0$$

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

($\sin\theta$, $-2\sin\theta$)

$$2\sin\theta + 1 = 0 \qquad \sin\theta - 1 = 0$$

$$2\sin\theta = -1 \qquad \sin\theta = 1$$

$$\sin\theta = -\frac{1}{2}$$

$$\theta = \frac{7\pi}{6}, \frac{11\pi}{6}, \frac{\pi}{2}$$

ex: Solve for $0 \le \theta < 2\pi$

$$\sin(2\theta) - \sqrt{3}\sin\theta = 0$$

$$2\sin\theta\cos\theta - \sqrt{3}\sin\theta = 0$$

$$\sin\theta\left(2\cos\theta - \sqrt{3}\right) = 0$$

$$\sin\theta = 0 \qquad 2\cos\theta - \sqrt{3} = 0$$

$$\theta = 0, \pi, \frac{\pi}{6}, \frac{11\pi}{6} \qquad \cos\theta = \frac{\sqrt{3}}{2}$$

Solve on $0 \le \theta < 2\pi$

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

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

$\cos\theta = 0$ $\quad 2\cos\theta + 1 = 0$

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

$\frac{\pi}{2}, \frac{3\pi}{2}, \frac{2\pi}{3}, \frac{4\pi}{3}$

2) $2\sin^2\theta + \sin\theta - 1 = 0$

3) $\sin^2\theta - \cos^2\theta = 1 + \cos\theta$

4) $(\tan\theta - 1)(\sec\theta - 1) = 0$

5) $\sin^2\theta = 6(\cos\theta + 1)$

$1 - \cos^2\theta = 6\cos\theta + 6$

$0 = \cos^2\theta + 6\cos\theta + 5$

$0 = (\cos\theta + 5)(\cos\theta + 1)$

$\cos\theta = -5$ ~~$\quad \cos\theta = -1$~~

$\theta = \pi$