

↙ multiple angle

Example #9  $\sin(2x) = -\frac{\sqrt{3}}{2}$  think  $\sin(A) = -\frac{\sqrt{3}}{2}$

$$\frac{2x}{2} = \frac{\frac{4\pi}{3} + 2n\pi}{2} \quad \frac{2x}{2} = \frac{\frac{5\pi}{3} + 2n\pi}{2} \quad \begin{matrix} A = \frac{4\pi}{3} + 2n\pi \\ \text{or} \\ A = \frac{5\pi}{3} + 2n\pi \end{matrix}$$

$$x = \frac{2\pi}{3} + n\pi \quad x = \frac{5\pi}{6} + n\pi$$

List on  $[0, 2\pi)$ :  $\frac{2\pi}{3}, \frac{5\pi}{3}, \frac{5\pi}{6}, \frac{11\pi}{6}$

Example #12  $2\sin^2\left(\frac{x}{2}\right) = 1$

$$\sqrt{\sin^2\left(\frac{x}{2}\right)} = \pm\sqrt{\frac{1}{2}}$$

$$\sin\left(\frac{x}{2}\right) = \pm\frac{\sqrt{2}}{2}$$

$\sin A = \pm\frac{\sqrt{2}}{2}$   
 $A = \frac{\pi}{4} + 2n\pi$   
 $\frac{3\pi}{4} + 2n\pi$   
 $\frac{5\pi}{4} + 2n\pi$   
 $\frac{7\pi}{4} + 2n\pi$

$$\left(\frac{x}{2}\right) = \left(\frac{\pi}{4} + 2n\pi\right)$$

$$x = \frac{\pi}{2} + 4n\pi, \quad \frac{3\pi}{2} + 4n\pi, \quad \frac{5\pi}{2} + 4n\pi, \quad \frac{7\pi}{2} + 4n\pi$$

List on  $[0, 2\pi)$ :  $\frac{\pi}{2}, \frac{3\pi}{2}$

Example #13

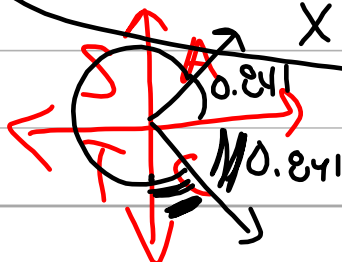
$$6\cos^2 x - 13\cos x + 6 = 0$$

$$(3\cos x - 2)(2\cos x - 3) = 0$$

$$\cos x = 2/3 \quad \cos x = 3/2$$

$$x = 0.841 + 2n\pi$$

$$x = 5.442 + 2n\pi$$



never happens

Example #14

$$\tan^2 x - 8\tan x + 13 = 0$$

$$\tan x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$\tan x = \frac{8 \pm \sqrt{64 - 4(1)(13)}}{2(1)} = \frac{8 \pm \sqrt{12}}{2} = \frac{8 \pm 2\sqrt{3}}{2} = 4 \pm \sqrt{3}$$

$$\tan x = 5.732, 2.268$$

$$\tan^{-1}(5.732) =$$

$$x = 1.398 + n\pi$$

$$\tan^{-1}(2.268) =$$

$$x = 1.156 + n\pi$$