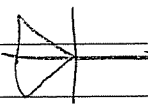


PW #3

① $2\cos x + 1 = 0$
 $\cos x = -1/2$
 $x = 2\pi/3, 4\pi/3$

② $\sqrt{3}\sec x - 2 = 0$
 $\sec x = \frac{2\sqrt{3}}{3}$
 $\cos x = \frac{3\sqrt{3}}{6} = \frac{\sqrt{3}}{2}$
 $x = \pi/6, 11\pi/6$

③ $\sqrt{2}\sin x + 1 = 0$
 $\sin x = -\sqrt{2}/2$
 $x = 5\pi/4, 7\pi/4$

④ $\cos 3x + \frac{\sqrt{3}}{2} = 0$
 $\cos 3x = -\sqrt{3}/2$ 
 $3x = 5\pi/6 + 2k\pi$
 $x = 5\pi/18 + 2k\pi/3$

⑤ $3\csc^2 x - 4 = 0$
 $\csc^2 x = 4/3$
 $\csc x = \pm 2\sqrt{3}/3$
 $\sin x = \pm \frac{3}{2\sqrt{3}} = \pm \frac{3\sqrt{3}}{6} = \pm \frac{\sqrt{3}}{2}$
 $x = \pi/3, 2\pi/3, 4\pi/3, 5\pi/3$

$3x = 7\pi/6 + 2k\pi$
 $x = 7\pi/18 + 2k\pi/3$

$x = 5\pi/18, 7\pi/18, 17\pi/18, 29\pi/18, 19\pi/18, 31\pi/18$

⑥ $4\cos^2 x - 3 = 0$
 $\cos^2 x = 3/4$
 $\cos x = \pm\sqrt{3}/2$
 $x = \pi/6, 5\pi/6, 7\pi/6, 11\pi/6$

⑦ $\cos x(\cos x - 1) = 0$
 $\cos x = 0$ or $\cos x = 1$
 $x = \pi/2, 3\pi/2, 0$

⑧ $(3\tan^2 x - 1)(\tan^2 x - 3) = 0$
 $\tan x = \pm\sqrt{3}/3$ or $\tan x = \pm\sqrt{3}$
 $x = \pi/6, \pi/3, 2\pi/3, 5\pi/6, 7\pi/6, 4\pi/3, 5\pi/3, 11\pi/6$

⑨ $\tan^2 x - 1 = 0$
 $\tan x = \pm 1$
 $x = \pi/4, 3\pi/4, 5\pi/4, 7\pi/4$

⑩ $2\sin^2 x - \cos x - 2 = 0$
 $2(1 - \cos^2 x) - \cos x - 2 = 0$
 $2 - 2\cos^2 x - \cos x - 2 = 0$
 $= -2\cos^2 x - \cos x = 0$
 $-\cos x(-2\cos x + 1) = 0$
 $\cos x = 0$ or $\cos x = 1/2$
 $x = \pi/2, 3\pi/2, \pi/3, 5\pi/3$

$$\textcircled{11} \quad \sec^2 x - \sec x - 2 = 0$$

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

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

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

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

$$\textcircled{12} \quad 3 \tan^3 x - \tan x = 0$$

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

$$\tan x = 0 \quad \tan x = \pm \frac{\sqrt{3}}{3}$$

$$x = 0, \pi, \frac{\pi}{6}, \frac{5\pi}{6}, \frac{7\pi}{6}, \frac{11\pi}{6}$$

$$\textcircled{13} \quad 2 \sin^2 x + 3 \sin x - 2 = 0$$

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

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

$$x = \frac{\pi}{6} + 2k\pi$$

$$x = \frac{5\pi}{6} + 2k\pi$$

$$\textcircled{14} \quad 2 \sin^2 x - \sin x - 1 = 0$$

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

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

$$x = \frac{7\pi}{6} + 2k\pi$$

$$x = \frac{11\pi}{6} + 2k\pi$$

$$x = \frac{\pi}{2} + 2k\pi$$

$$\textcircled{15} \quad \sin x + \sin x \cos x = 0$$

$$\sin x (1 + \cos x) = 0$$

$$\sin x = 0 \quad \cos x = -1$$

$$x = \pi k$$

$$\textcircled{16} \quad 2 \cos^2 x - 5 \cos x + 2 = 0$$

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

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

$$x = \frac{\pi}{3} + 2k\pi$$

$$x = \frac{5\pi}{3} + 2k\pi$$

$$\textcircled{17} \quad \sin^2 x = \cos x - 1$$

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

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

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

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

$$x = 2\pi n$$

$$\textcircled{18} \quad 3 \sin^2 x - \cos^2 x = 0$$

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

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

$$4 \sin^2 x - 1 = 0$$

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

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

$$x = \frac{\pi}{6} + \pi k$$

$$x = \frac{5\pi}{6} + \pi k$$

$$\textcircled{19} \quad 4 \cos^2 x = 1$$

$$4 \cos^2 x - 1 = 0$$

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

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

$$x = \frac{\pi}{3} + k\pi$$

$$x = \frac{2\pi}{3} + k\pi$$

$$\textcircled{20} \quad \sin^4 x - 2 \sin^2 x + 1 = 0$$

$$(\sin^2 x - 1)(\sin^2 x - 1) = 0$$

$$\sin x = \pm 1 \quad \sin x = \pm 1$$

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

$$\textcircled{21} \quad \csc^2 x = 3 \csc x + 4$$

$$\csc^2 x - 3 \csc x - 4 = 0$$

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

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

$$\sin x = \frac{1}{4} \quad \sin x = -1$$

$$x = 2.05 + 2k\pi \quad x = \frac{3\pi}{2} + 2k\pi$$

$$x = 2.89 + 2k\pi$$

Not on circle