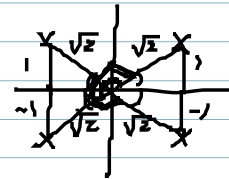


$$2 \sin^2(\theta + \frac{\pi}{3}) = 1$$

$$\sin^2(\theta + \frac{\pi}{3}) = \frac{1}{2}$$

$$\sin(\theta + \frac{\pi}{3}) = \pm \sqrt{\frac{1}{2}} = \pm \frac{1}{\sqrt{2}} = \pm \frac{\sqrt{2}}{2}$$



$$\begin{aligned} \theta + \frac{\pi}{3} &= \frac{\pi}{4} + 2\pi n \\ &= \frac{3\pi}{4} + 2\pi n \\ &= \frac{5\pi}{4} + 2\pi n \\ &= \frac{7\pi}{4} + 2\pi n \end{aligned} \quad \left. \begin{array}{l} \frac{\pi}{4} + \pi n \\ \frac{3\pi}{4} + \pi n \end{array} \right\} \frac{\pi}{4} + \frac{\pi}{2} n$$

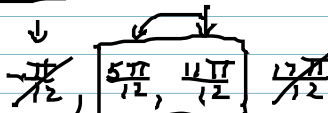
$$\frac{\pi}{2} = \frac{6\pi}{12}$$

$$\frac{\pi}{4} = \frac{3\pi}{12}$$

$$\theta = -\frac{\pi}{12} + \frac{\pi}{2} n, \quad n \in \mathbb{Z}$$

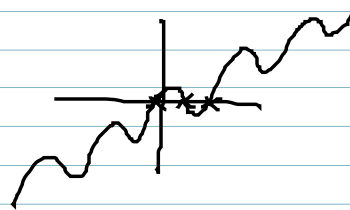
$$\frac{\pi}{2} \cdot \frac{6}{6} = \frac{6\pi}{12}$$

$$\theta \in [0, 2\pi)$$



$$\underline{x} + 5 \cos(\underline{x}) = 0$$

$$\boxed{-1.306, 1.977, 3.837}$$



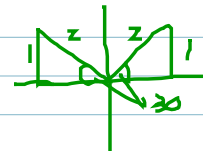
$$\sin(2\theta - \frac{\pi}{3}) = \frac{1}{2}$$

$$u = \frac{\pi}{6} + 2\pi n = 2\theta - \frac{\pi}{3}$$

$$\frac{5\pi}{6} + 2\pi n$$

$$\sin(u) = \frac{1}{2}$$

$$\frac{\pi}{6}$$



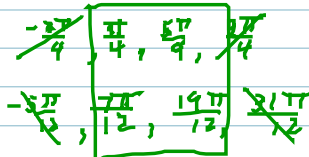
$$\frac{5\pi}{6} + 2\pi n = 2\theta$$

$$\frac{2\pi}{6} + 2\pi n$$

$$\theta = \frac{\pi}{4} + \pi n, \quad n \in \mathbb{Z}$$

$$= \frac{3\pi}{12} + \pi n$$

$$\theta \in [0, 2\pi)$$



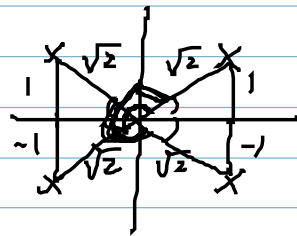
$$\frac{3\pi}{4}$$

$$\frac{13\pi}{12}$$

$$2 \sin^2(\theta + \frac{\pi}{3}) = 1$$

$$\sin^2(\theta + \frac{\pi}{3}) = \frac{1}{2}$$

$$\sin(\theta + \frac{\pi}{3}) = \pm \sqrt{\frac{1}{2}} = \pm \frac{1}{\sqrt{2}} = \pm \frac{\sqrt{2}}{2}$$



$$\theta + \frac{\pi}{3} = \frac{\pi}{4} + 2\pi n$$

$$= \frac{3\pi}{4} + 2\pi n$$

$$= \frac{5\pi}{4} + 2\pi n$$

$$= \frac{7\pi}{4} + 2\pi n$$

$$\left. \begin{array}{l} \frac{\pi}{4} + \pi n \\ \frac{3\pi}{4} + \pi n \end{array} \right\} \frac{\pi}{4} + \frac{\pi}{2} n$$

$$\frac{\pi}{3} = \frac{4\pi}{12}$$

$$\frac{\pi}{4} = \frac{3\pi}{12}$$

$$\theta = -\frac{\pi}{12} + \frac{\pi}{2} n, n \in \mathbb{Z}$$

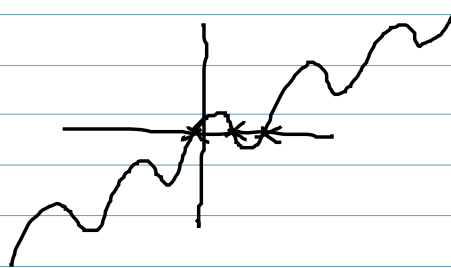
$$\frac{\pi}{2} \cdot 6 = \frac{6\pi}{12}$$

$$\theta \in [0, 2\pi)$$

$$\frac{\pi}{12}, \frac{5\pi}{12}, \frac{11\pi}{12}, \frac{17\pi}{12}$$

$$x + 5 \cos(x) = 0$$

$$-1.306, 1.977, 3.837$$



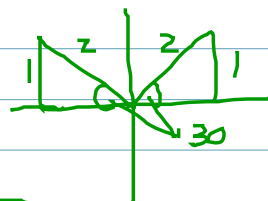
$$\sin(2\theta - \frac{\pi}{3}) = \frac{1}{2}$$

$$u = \frac{\pi}{6} + 2\pi n = 2\theta - \frac{\pi}{3}$$

$$\frac{5\pi}{6} + 2\pi n$$

$$\sin(u) = \frac{1}{2}$$

$$\frac{2\pi}{6}$$



$$\frac{3\pi}{6} + 2\pi n = 2\theta$$

$$\frac{7\pi}{6} + 2\pi n$$

$$\theta = \frac{\pi}{4} + \pi n, n \in \mathbb{Z}$$

$$= \frac{7\pi}{12} + \pi n$$

$$\theta \in [0, 2\pi)$$

$$\frac{\pi}{4}, \frac{5\pi}{4}, \frac{7\pi}{12}, \frac{19\pi}{12}$$

$$\frac{4\pi}{4}$$

$$\frac{12\pi}{12}$$

$$2 \cos^2(\theta) - 7 \cos(\theta) + 4 = 0$$

$$2u^2 - 7u + 4 = 0$$

$$(2u + 1)(u - 4) = 0$$

$$2u + 1 = 0$$

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

$$u - 4 = 0$$

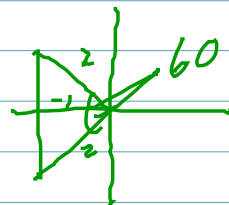
$$u = 4$$

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

$$\cos(\theta) = 4$$

$$\theta = \frac{2\pi}{3} + 2\pi n, n \in \mathbb{Z}$$

$$\frac{4\pi}{3} + 2\pi n$$



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

$$3 - 3\cos(\theta) = 1 - \cos^2(\theta)$$

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

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

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

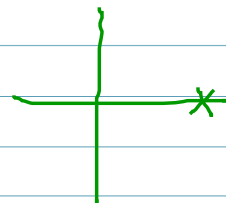
$$u = 2, 1$$

$$\cos(\theta) = 2$$

$$\cos(\theta) = 1$$

$$\theta = 0 + 2\pi n$$

$$= 2\pi n, n \in \mathbb{Z}$$



$$\sec^2(\theta) + 2\tan(\theta) = 0$$

$$1 + \tan^2(\theta) + 2\tan(\theta) = 0$$

$$\tan^2(\theta) + 2\tan(\theta) + 1 = 0$$

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

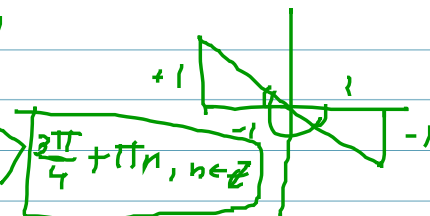
$$(u + 1)^2 = 0$$

$$u = -1$$

$$\tan(\theta) = -1$$

$$\theta = \frac{3\pi}{4} + 2\pi n$$

$$= \frac{7\pi}{4} + 2\pi n$$



$$\sec(\theta) = \tan(\theta) + \cot(\theta)$$

$$\frac{1}{\cos(\theta)} = \frac{\sin(\theta)}{\cos(\theta)} + \frac{\cos(\theta)}{\sin(\theta)}$$

$$\frac{\sin(\theta)}{\sin(\theta)\cos(\theta)} = \frac{\sin^2(\theta) + \cos^2(\theta)}{\sin(\theta)\cos(\theta)} = \frac{1}{\sin(\theta)\cos(\theta)}$$

$$\sin(\theta) = 0$$

$$\theta \neq \pi n$$

$$\cos(\theta) = 0$$

$$\frac{\pi}{2} + \pi n \neq \theta$$

$$\sin(\theta) = 1$$



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

No Solution

$$\underline{2 \sin(\theta) + \tan(\theta) - 1} = \underline{2 \sin(\theta) + \tan(\theta) - 1} = 0$$

$$2 \sin(\theta) (\underline{\tan(\theta) - 1}) + (\underline{\tan(\theta) - 1}) =$$

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

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

$$\tan(\theta) = 1$$

$$\theta = \frac{\pi}{4} + 2\pi n$$

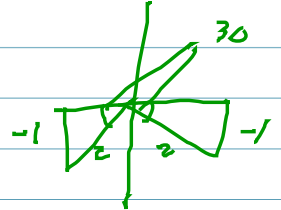
$$= \frac{5\pi}{4} + 2\pi n$$

$$\boxed{\frac{\pi}{4} + \pi n, n \in \mathbb{Z}}$$

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

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

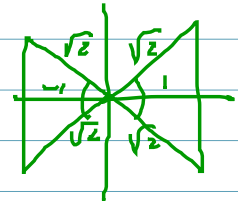
$$\theta = \boxed{\begin{matrix} \frac{7\pi}{6} + 2\pi n \\ \frac{11\pi}{6} + 2\pi n \end{matrix}}$$



$$2 \cos^2(2\theta - \frac{5\pi}{3}) = 1$$

$$\cos^2(2\theta - \frac{5\pi}{3}) = \frac{1}{2}$$

$$\cos(2\theta - \frac{5\pi}{3}) = \pm \sqrt{\frac{1}{2}} = \pm \frac{1}{\sqrt{2}} = \pm \frac{\sqrt{2}}{2}$$



$$2\theta - \frac{5\pi}{3} = \begin{matrix} \frac{\pi}{4} + 2\pi n \\ \frac{3\pi}{4} + 2\pi n \\ \frac{5\pi}{4} + 2\pi n \\ \frac{7\pi}{4} + 2\pi n \end{matrix} \left. \vphantom{\frac{5\pi}{3}} \right\} \frac{\pi}{4} + \frac{\pi}{2} n$$

$$\frac{\pi}{4} = \frac{3\pi}{12}$$

$$\frac{5\pi}{3} = \frac{20\pi}{12}$$

$$2\theta = \frac{23\pi}{12} + \frac{\pi}{2} n$$

$$\theta \in [0, 2\pi)$$

$$23\pi/24$$

$$2\pi = \frac{48\pi}{24}$$

$$\frac{\pi}{4} = \frac{6\pi}{24}$$

$$\boxed{\theta = \frac{23\pi}{24} + \frac{\pi}{4} n, n \in \mathbb{Z}}$$

$$\boxed{\frac{5\pi}{24}, \frac{11\pi}{24}, \frac{17\pi}{24}, \frac{23\pi}{24}, \frac{29\pi}{24}, \frac{35\pi}{24}, \frac{41\pi}{24}, \frac{47\pi}{24}}$$

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

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

$$\sin(\theta) = \frac{1}{2} \quad \sin(\theta) = -1$$

$$\theta = \frac{\pi}{6} + 2\pi n$$

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

$$\theta = \frac{3\pi}{2} + 2\pi n$$

$$\boxed{\frac{\pi}{6} + \frac{2\pi}{3} n, n \in \mathbb{Z}}$$

