

Solve $[0, 2\pi)$. CHOOSE 5 OF THE 6 and circle them so I know which you want graded.

✓ 1. $\csc^2(x) - \sqrt{2} \csc(x) = 0$

$$\csc(x) [\csc(x) - \sqrt{2}] = 0$$

$$\csc(x) = 0 \quad \csc(x) = \sqrt{2}$$

$$\sin(x) = 0 \quad \sin(x) = \frac{1}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}}$$

$$x = 0, \pi \quad \sin(x) = \frac{\sqrt{2}}{2}$$

$$x = \frac{\pi}{4}, \frac{3\pi}{4}$$

$$x = 0, \pi, \frac{\pi}{4}, \frac{3\pi}{4}$$

online says only these

✓ 3. $\tan^2 x + \sec x = 1$

$$\sec^2 x - 1 + \sec x = 1$$

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

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

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

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

$$\sec x + 2 = 0$$

$$\sec x = -2$$

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

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

$$\sec x - 1 = 0$$

$$\sec x = 1$$

$$\cos x = 1$$

$$x = 0$$

$$x = 0, \frac{2\pi}{3}, \frac{4\pi}{3}$$

✓ 5. $2 \cos 2x \sin x - \sqrt{3} \sin x = 0$

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

$$\sin x = 0$$

$$x = 0, \pi$$

$$2 \cos 2x - \sqrt{3} = 0$$

$$2 \cos 2x = \sqrt{3}$$

$$\cos 2x = \frac{\sqrt{3}}{2}$$

$$\cos x = \frac{\sqrt{3}}{2}$$

$$x = \frac{11\pi}{6}, \frac{\pi}{6}$$

$$\frac{11\pi}{6} = \frac{11\pi}{6} \cdot \frac{1}{2} = \frac{11\pi}{12}$$

$$\frac{\pi}{6} = \frac{\pi}{6} \cdot \frac{1}{2} = \frac{\pi}{12}$$

$$x = \frac{11\pi}{12}, \frac{\pi}{12}$$

$$x = 0, \pi, \frac{\pi}{12}, \frac{11\pi}{12}$$

$$\frac{13\pi}{12}, \frac{23\pi}{12}$$

✓ 2. $\sin(2x) = \cos(x)$

$$\sin 2x - \cos x = 0$$

$$2 \sin x \cos x - \cos x = 0$$

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

$$\cos x = 0$$

$$x = \frac{\pi}{2}, \frac{3\pi}{2}$$

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

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

$$x = \frac{\pi}{6}, \frac{5\pi}{6}$$

$$x = \frac{\pi}{2}, \frac{3\pi}{2}, \frac{\pi}{6}, \frac{5\pi}{6}$$

✓ 4. $5 \sin^2 x - 4 \sin x - 1 = 0$

$$5x^2 - 4x - 1 = 0 \quad (5x+1)(x-1)$$

$$(5 \sin x + 1)(\sin x - 1) = 0$$

$$5 \sin x + 1 = 0$$

$$\sin x = -\frac{1}{5}$$

$$x = -0.20 \text{ rads}$$

$$6.08 \text{ rads}$$

$$\sin x - 1 = 0$$

$$\sin x = 1$$

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

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

✓ 6. $2 \sin^2(x) + \sin(x) = 0$

$$\sin(x) [2 \sin(x) + 1] = 0$$

$$\sin x = 0$$

$$x = 0, \pi$$

$$2 \sin x + 1 = 0$$

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

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

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