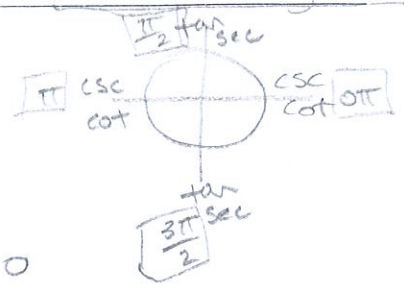


undefined trig values



Solve the following equations over  $[0, 2\pi)$ .

1.  $\sin x \tan x = -\tan x$

$$\sin x \tan x + \tan x = 0$$

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

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

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

3.  $(\cos^2 x - 1)(\cot x + 1) = 0$

$$\sqrt{\cos^2 x} = \pm 1 \quad \cot x = -1$$

$$\cos x = \pm 1 \quad x = \frac{3\pi}{4}, \frac{7\pi}{4}$$

$$x = 0\pi, \pi$$

5.  $\sin^2 x \tan x = \tan x$

$$\sin^2 x \tan x - \tan x = 0$$

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

$$\tan x = 0 \quad \sin^2 x = 1$$

$$x = 0\pi, \pi \quad \sin x = \pm 1$$

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

7.  $\cos x \tan x = \sqrt{3} \cos x$

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

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

$$\cos x = 0 \quad \tan x = \sqrt{3}$$

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

9.  $\sec x \csc x = \csc x$

$$\sec x \csc x - \csc x = 0$$

$$\csc x (\sec x - 1) = 0$$

$$\csc x = 0 \quad \sec x = 1$$

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

$$\rightarrow \text{undefined} \quad x = 0\pi \quad \emptyset$$

11.  $\cot x \tan x = -\sqrt{3} \cot x$

$$\cot x \tan x + \sqrt{3} \cot x = 0$$

$$\cot x (\tan x + \sqrt{3}) = 0$$

$$\cot x = 0 \quad \tan x = -\sqrt{3}$$

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

2.  $\cos x - \cot x = 0$

$$\sin x (\cos x - \frac{\cos x}{\sin x}) = 0$$

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

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

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

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

4.  $\cos x (\sec x - 2) = 0$

$$\cos x = 0 \quad \sec x = 2$$

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

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

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

check  $\left\{ \begin{array}{l} \sec \frac{\pi}{2} = \frac{1}{0} = \text{und.} \\ \sec \frac{3\pi}{2} = \frac{1}{0} = \text{und.} \end{array} \right.$

6.  $\cos^2 x + 2 \cos x - 3 = 0$

$$(\cos x + 3)(\cos x - 1) = 0$$

$$\cos x = -3 \quad \cos x = 1$$

$$x = 0\pi$$

8.  $\cos x \sec x + 2 \cos x = 0$

$$\cos x (\sec x + 2) = 0$$

$$\cos x = 0 \quad \sec x = -2$$

$$x = \frac{\pi}{2}, \frac{3\pi}{2} \quad \cos x = -\frac{1}{2}$$

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

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

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

$$x = \frac{3\pi}{2} \quad \cos x = \frac{1}{2}$$

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

12.  $3 \cot x \cos x - \sqrt{3} \cos x = 0$

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

$$\cos x = 0 \quad 3 \cot x = \sqrt{3}$$

$$x = \frac{\pi}{2}, \frac{3\pi}{2} \quad \cot x = \frac{\sqrt{3}}{3}$$

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