LT: Solve Trigonometric Functions

Part 1: Isolate the trig function

Ex 1) $\sin x + 2 = 3$

$-2 \quad -2$

$\sin x = 1$

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

Ex 2) $\cot x = 2\cot x$

$-\cot x \quad -\cot x$

$0 = \cot x$

$\frac{1}{0} = \tan x$

Undefined $= \tan x$

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

You try: $1 + 2\cos x = 0$

$-1 \quad -1$

$2\cos x = -1$

2

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

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

Part 2: Collect Like Terms

Ex 3) $\csc x + 2 = -\csc x$

$+\csc x \quad +\csc x$

$2\csc x + 2 = 0$

$-2 \quad -2$

$\frac{2\csc x}{2} = \frac{-2}{2}$

$\csc x = -1$

$\sin x = -1$

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

You Try: $\cos x + \sqrt{2} = -\cos x$

$-\cos x \quad -\cos x$

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

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

$x = \frac{3\pi}{4}, \frac{5\pi}{4}$

Part 3: Using Square Roots

Ex 4) $\frac{3\tan^2 x}{3} = \frac{1}{3}$

$\sqrt{\tan^2 x} = \sqrt{\frac{1}{3}}$

$\tan x = \pm\frac{\sqrt{1}}{\sqrt{3}}$

$\tan x = \pm\frac{1\cdot\sqrt{3}}{\sqrt{3}\cdot\sqrt{3}}$

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

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

You Try: $\sec^2 x - 1 = 0$

$+1 \quad +1$

$\sqrt{\sec^2 x} = \sqrt{1}$

$\sec x = \pm 1$

$\cos x = \pm 1$

$x = 0, \pi$