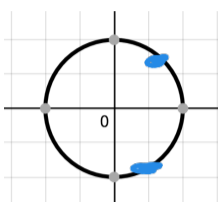Trigonometry – more equations for practice
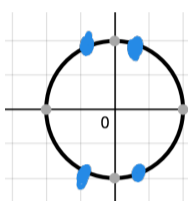
Solve for $0 \le x < 2\pi$

:

**(1)** $\sec x - \sqrt{2} = 0$

$Sec x = \sqrt{2}$

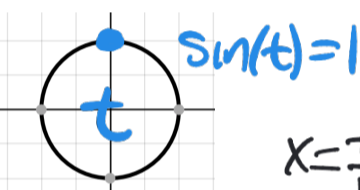$Cos x = \frac{1}{\sqrt{2}} \text{ or } \frac{\sqrt{2}}{2}$

$X = \frac{\pi}{4}, \frac{7\pi}{4}$

**(2)** $4\cos^2(x) - 1 = 0$

$4cos^2(x) = 1$

$cos^2(x) = \frac{1}{4}$

$cos(x) = \pm\sqrt{\frac{1}{4}} = \pm\frac{1}{2}$

$X = \frac{\pi}{3}, \frac{2\pi}{3}, \frac{4\pi}{3}, \frac{5\pi}{3}$

**(3)** $\sin 5x = 1$

$t = 5X = \frac{\pi}{2} + 2\pi k$

$Sin(t) = 1$

$X = \frac{\pi}{10} + \frac{2\pi}{5}k = \frac{\pi}{10} + \frac{4\pi}{10}k$

$X = \frac{\pi}{10}, \frac{5\pi}{10}, \frac{9\pi}{10}, \frac{14\pi}{10}, \frac{19\pi}{10}, \frac{23\pi}{10}$
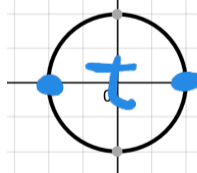
$X = \frac{\pi}{10}, \frac{\pi}{2}, \frac{9\pi}{10}, \frac{7\pi}{5}, \frac{19\pi}{10}$

Find all solutions:
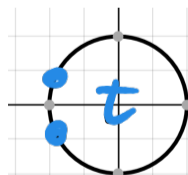
**(4)** $\tan(2x+1) = 0;$     $tan(t) = 0$

$t = 2x + 1 = \pi k$

$2x = \pi k - 1$

$x = \frac{1}{2}\pi k - \frac{1}{2}$

$X = \frac{1}{2}\pi k - \frac{1}{2}$

**(5)** $2\cos 4x + \sqrt{3} = 0$

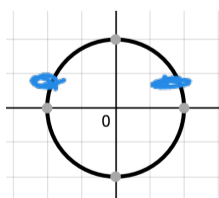$2cos 4x = -\sqrt{3}$

$cos 4x = -\frac{\sqrt{3}}{2}$

$t = 4x = \frac{5\pi}{6} + 2\pi k, \frac{7\pi}{6} + 2\pi k$

$X = \frac{5\pi}{24} + \frac{\pi k}{2}, \frac{7\pi}{24} + \frac{\pi k}{2}$

**(6)** $5\csc(x) - 4 = 3\csc(x)$

$2csc(x) = 4$

$csc(x) = \frac{4}{2} = 2$

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

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

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

K is an integer