

Trigonometry –Ten equations to practice

Solve for  $0 \leq x < 2\pi$

(1)  $\sqrt{3} \tan 2x - 1 = 0$

Answers:

$$x = \frac{\pi}{12}, \frac{7\pi}{12}, \frac{13\pi}{12}, \frac{19\pi}{12}$$

(2)  $10 \cos^2 x - 13 \cos x - 3 = 0$

$$x = \pi + \cos^{-1}\left(\frac{1}{5}\right), \pi - \cos^{-1}\left(\frac{1}{5}\right)$$

(3)  $4 \tan x + 5 = 0$

$$x = 2\pi - \tan^{-1}\left(\frac{5}{4}\right), \pi - \tan^{-1}\left(\frac{5}{4}\right)$$

(4)  $\sin 3x - \sin 2x = 0$

$$x = 0, \frac{\pi}{5}, \frac{3\pi}{5}, \pi, \frac{7\pi}{5}, \frac{9\pi}{5}$$

Find all solutions:

(5)  $2\cos^2 2x = 1$

$$x = \frac{\pi}{8} + \frac{\pi}{4}k$$

(6)  $3 \tan^2 x - \sec^2 x - 5 = 0$

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

(7)  $2 \sin 2x - \cos x = 0$

$$x = \frac{\pi}{2} + \pi k, \sin^{-1} \frac{1}{4} + 2\pi k, \pi - \sin^{-1} \frac{1}{4} + 2\pi k$$

(8)  $2\sin^2 x - \cos 2x = 0$

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

(9)  $\cos x \csc 4x + \cos x - 2\csc 4x - 2 = 0$

$$x = \frac{3\pi}{8} + \frac{\pi}{2}k$$

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

$$x = \frac{\pi}{4} + \pi k$$