Trigonometry –Ten equations to practice

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

Answers:

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

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

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

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

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

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

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

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

Find all solutions:

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

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

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

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

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

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

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

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