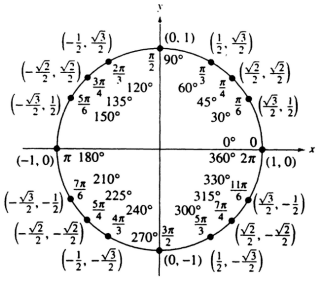
5.3 Continued...

Find the general solutions and list all solutions on the interval: $[0, 2\pi)$.



$$1.)\ 2\cos 3x - 1 = 0$$

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

$\frac{\cancel{3}x}{\cancel{3}} = \frac{\frac{\pi}{3} + 2\pi n}{3}$ $\qquad$ $\frac{3x}{3} = \frac{\frac{5\pi}{3} + 2\pi n}{3}$

$\boxed{x = \frac{\pi}{9} + \frac{2\pi}{3}n}$ $\qquad$ $\boxed{x = \frac{5\pi}{9} + \frac{2\pi}{3}n}$

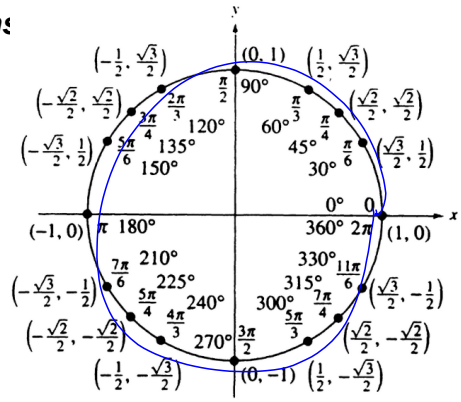
$\frac{6\pi}{9}$

$[0, 2\pi)$: $\frac{\pi}{9}, \frac{7\pi}{9}, \frac{13\pi}{9}, \cancel{\frac{19\pi}{9}}$

$\frac{5\pi}{9}, \frac{11\pi}{9}, \frac{17\pi}{9}$

Apr 27-11:49 AM

Find the general solutions and list all solutions on the interval: $[0, 2\pi)$.



$$2.)\ \tan 4x = 1$$

$\frac{4x}{4} = \frac{\frac{\pi}{4} + \pi n}{4}$ $\qquad$ $\frac{4x}{4} = \frac{\frac{5\pi}{4} + \pi n}{4}$

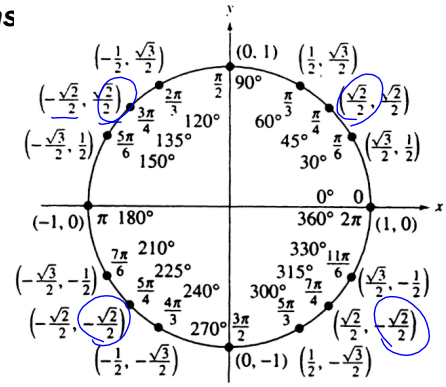
$\boxed{x = \frac{\pi}{16} + \frac{\pi}{4}n}$ $\qquad$ $\boxed{x = \cancel{\frac{5\pi}{16}} + \frac{\pi}{4}n}$

$\frac{32\pi}{16} = 2\pi$

$[0, 2\pi)$: $\frac{\pi}{16}, \frac{5\pi}{16}, \frac{9\pi}{16}, \frac{13\pi}{16}, \frac{17\pi}{16}, \frac{21\pi}{16}, \frac{25\pi}{16}, \frac{29\pi}{16}$

Apr 27-11:52 AM

Find the general solutions and list all solutions on the interval: $[0, 2\pi)$.



$$3.)\ 2\sin^2 2x = 1$$

$$\sqrt{\sin^2 2x} = \sqrt{\frac{1}{2}}$$

$$\sin 2x = \pm\frac{\sqrt{2}}{2}$$

$2x = \frac{\pi}{4} + 2\pi n$ $\quad \frac{\pi}{8}, \frac{9\pi}{8}$

$x = \frac{\pi}{8} + \pi n$

$2x = \frac{3\pi}{4} + 2\pi n$ $\quad \frac{3\pi}{8}, \frac{11\pi}{8}$

$x = \frac{3\pi}{8} + \pi n$

$2x = \frac{5\pi}{4} + 2\pi n$ $\quad \frac{5\pi}{8}, \frac{13\pi}{8}$

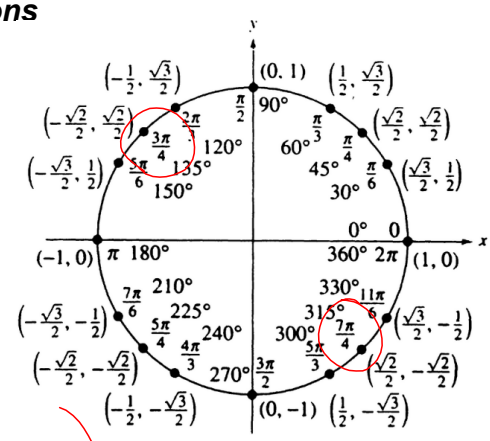
$x = \frac{5\pi}{8} + \pi n$

$2x = \frac{7\pi}{4} + 2\pi n$ $\quad \frac{7\pi}{8}, \frac{15\pi}{8}$

$x = \frac{7\pi}{8} + \pi n$

Apr 27-11:52 AM

Find the general solutions and list all solutions on the interval: $[0, 2\pi)$.



$$4.)\ 3\tan\frac{x}{2} + 3 = 0$$

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

$2 \cdot \frac{1}{2}x = 2\left(\frac{3\pi}{4} + \pi n\right)$

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

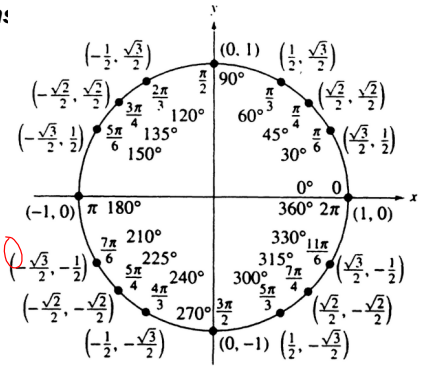
$x = \frac{3\pi}{2}$

$2 \cdot \frac{1}{2}x = 2\left(\frac{7\pi}{4} + \pi n\right)$

$x = \frac{7\pi}{2} + 2\pi n$

Apr 27-11:53 AM

Find the general solutions and list all solutions on the interval: $[0, 2\pi)$.



5.) $\sin^2 3x - 2\sin 3x + 1 = 0$

$x^2 - 2x + 1$

$(x-1)(x-1)$

$(\sin 3x - 1)(\sin 3x - 1) = 0$

$\sin 3x - 1 = 0$

$\sin 3x = 1$

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

$x = \frac{\pi}{6} + \frac{2\pi}{3} n$

$x = \frac{\pi}{6}, \frac{5\pi}{6}, \cancel{\frac{9\pi}{6}}, \frac{3\pi}{2}$

Apr 27-11:53 AM