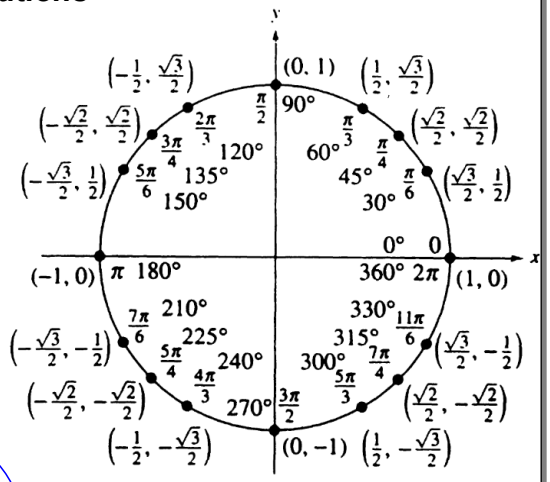
5.1 - 5.2 Extension

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



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

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

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

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

$x = \frac{\pi}{9}, \frac{7\pi}{9}, \frac{13\pi}{9}, \frac{5\pi}{9}, \frac{11\pi}{9}, \frac{17\pi}{9}$

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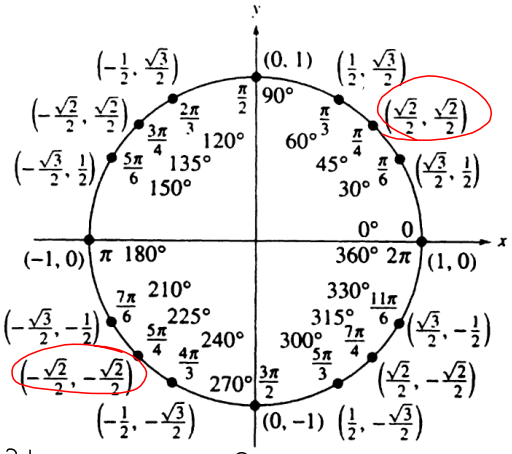
Find the general solution and then list all solutions on the interval: $[0, 2\pi)$.



2.) $\tan 4x = 1$

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

$x = \frac{\pi}{16} + \frac{\pi}{4}n$ $\quad x = \frac{5\pi}{16} + \frac{\pi}{4}n$

$x = \frac{\pi}{16}, \frac{5\pi}{16}, \frac{9\pi}{16}, \frac{13\pi}{16}, \frac{17\pi}{16}, \frac{21\pi}{16}, \frac{25\pi}{16}, \frac{29\pi}{16}$

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

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

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

$\frac{\sqrt{1}}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{\sqrt{2}}{2}$

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

$\frac{2x}{2} = \frac{\pi}{4} + 2\pi n$

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

$2x = \frac{3\pi}{4} + 2\pi n$

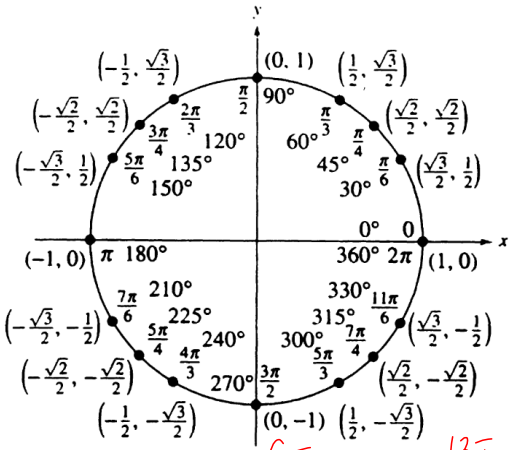
$x = \frac{3\pi}{8} + \pi n$

$2x = \frac{5\pi}{4} + 2\pi n$

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

$2x = \frac{7\pi}{4} + 2\pi n$

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



$x = \frac{\pi}{8}, \frac{9\pi}{8}, \frac{5\pi}{8}, \frac{13\pi}{8}, \frac{3\pi}{8}, \frac{11\pi}{8}, \frac{7\pi}{8}, \frac{15\pi}{8}$

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

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

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

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

$\frac{3\pi}{4} + 2\pi n$ $\quad \frac{3\pi}{8} + \pi n$

$\frac{5\pi}{4} + 2\pi n$ $\quad \frac{5\pi}{8} + \pi n$

$\frac{7\pi}{4} + 2\pi n$ $\quad \frac{7\pi}{8} + \pi n$

$[0, 2\pi)$: $\frac{\pi}{8}, \frac{9\pi}{8}$

$\frac{3\pi}{8}, \frac{11\pi}{8}$

$\frac{5\pi}{8}, \frac{13\pi}{8}$

$\frac{7\pi}{8}, \frac{15\pi}{8}$

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