6.6

9. $4\sin x\cos x - 2\sqrt{3}\sin x - 2\sqrt{2}\cos x + \sqrt{6} = 0$

$2\sin x(2\cos x - \sqrt{3}) - \sqrt{2}(2\cos x - \sqrt{3}) = 0$

$(2\cos x - \sqrt{3})(2\sin x - \sqrt{2}) = 0$

$\cos x = \frac{\sqrt{3}}{2}$ $\sin x = \frac{\sqrt{2}}{2}$

$x = \frac{\pi}{6}, \frac{11\pi}{6}$ $x = \frac{\pi}{4}, \frac{3\pi}{4}$

67. $\sin\left(2x + \frac{\pi}{6}\right) = -\frac{1}{2}$

$2x + \frac{\pi}{6} = \frac{7\pi}{6} + 2\pi k$

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

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

$2x + \frac{\pi}{6} = \frac{11\pi}{6} + 2\pi k$

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

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

77. $\sin 2x\cos x + \cos 2x \sin x = 0$

$\sin(2x+x) = 0$

$\sin 3x = 0$

$3x = 0, \pi, 2\pi, 3\pi, 4\pi, 5\pi$

$x = 0, \frac{\pi}{3}, \frac{2\pi}{3}, \pi, \frac{4\pi}{3}, \frac{5\pi}{3}$

73. $\sin 4x - \sin 2x = 0$

$2\sin 2x\cos 2x - \sin 2x = 0$

$\sin 2x(2\cos 2x - 1) = 0$

$\sin 2x = 0 \qquad \cos 2x = \frac{1}{2}$

$2x = 0, \pi, 2\pi, 3\pi \qquad 2x = \frac{\pi}{3}, \frac{5\pi}{3}, \frac{7\pi}{3}, \frac{11\pi}{3}$

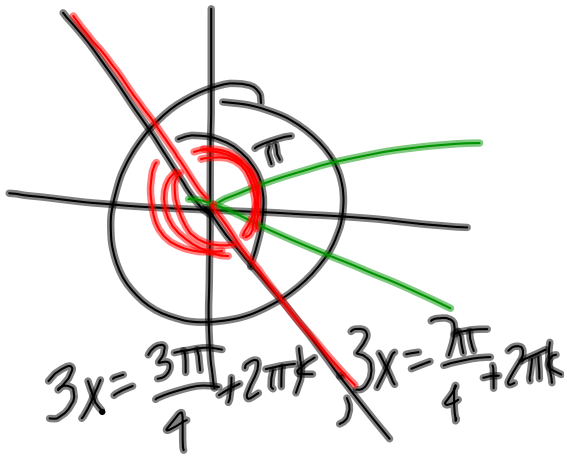
$x = 0, \frac{\pi}{2}, \pi, \frac{3\pi}{2} \qquad x = \frac{\pi}{6}, \frac{5\pi}{6}, \frac{7\pi}{6}, \frac{11\pi}{6}$

$\tan(3x) = -1$

$3x = \frac{3\pi}{4}, \frac{7\pi}{4}$

$3x = \frac{3\pi}{4} + \pi k$

$x = \frac{\pi}{4} + \frac{\pi k}{3}$



$x = \frac{\pi}{4} + \frac{2\pi k}{3}$ & $\frac{7\pi}{12} + \frac{2\pi k}{3}$

$\cos\left(2x - \frac{\pi}{6}\right) = \frac{\sqrt{3}}{2}$

$2x - \frac{\pi}{6} = \frac{\pi}{6} + 2\pi k$ $\quad 2x - \frac{\pi}{6} = \frac{11\pi}{6} + 2\pi k$

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

$x = \frac{\pi}{6} + \pi k$ $\quad x = \pi + \pi k$

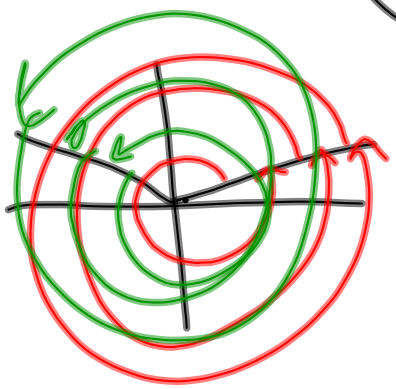
$x = \pi k$

$\sin 4x = \frac{1}{2}$

$0 \le x < 2\pi$

$0 \le 4x < 8\pi$

$4x = \frac{\pi}{6}, \frac{5\pi}{6}, \frac{13\pi}{6}, \frac{17\pi}{6}, \frac{25\pi}{6}, \frac{29\pi}{6}, \frac{37\pi}{6}, \frac{41\pi}{6}$



$x = \frac{\pi}{24}, \frac{5\pi}{24}, \frac{13\pi}{24}, \frac{17\pi}{24}, \frac{25\pi}{24}, \frac{29\pi}{24}, \frac{37\pi}{24}, \frac{41\pi}{24}$

$2\pi \cdot \frac{6}{6} = \frac{12\pi}{6}$

$\tan 2x = 0$

$2x = 0, \pi, 2\pi, 3\pi$

$x = 0, \frac{\pi}{2}, \pi, \frac{3\pi}{2}$