6.6 #1-21 odd 11 finding solutions between 0 and 2pi
#61-69 odd 5 finding all possible solutions (+2pi*k)
#71-83 odd 7

due Tues 01/31

Quiz on solving equations Fri. Feb 3; Test #4 - Wed. Feb 8

solve for $x \in [0, 2\pi)$

72. $\cos 2x = 2\cos x - 1$

$2\cos^2 x - 1 = 2\cos x - 1$

$+1 \quad +1$

$\frac{2\cos^2 x}{2} = \frac{2\cos x}{2}$

$\cos^2 x = \cos x$

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

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

$\cos x = 0$ $\quad$ $\cos x - 1 = 0$

$x = \frac{\pi}{2}, \frac{3\pi}{2}$ $\quad$ $\cos x = 1$

$x = 0$

$x^2 = x$

$x = 1$

$x^2 - x = 0$

$x(x-1) = 0$

$x = 0 \quad x = 1$

$x \in [0, 2\pi)$

$0 \le x < 2\pi$

$0 \le 2x < 4\pi$

74. $\sin 4x - \cos 2x = 0$

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

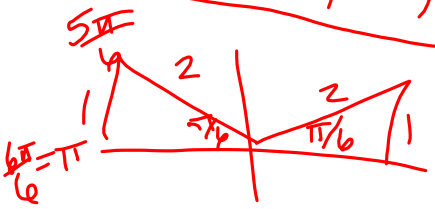
$2\sin 2x \cos 2x - \cos 2x = 0$

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

$\cos 2x = 0$

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

$x = \frac{\pi}{4}, \frac{3\pi}{4}, \frac{5\pi}{4}, \frac{7\pi}{4}$



$2\sin 2x - 1 = 0$

$2\sin 2x = 1$

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

$2x = \frac{\pi}{6}, \frac{5\pi}{6}, \frac{13\pi}{6}, \frac{17\pi}{6}$

$x = \frac{\pi}{12}, \frac{5\pi}{12}, \frac{13\pi}{12}, \frac{17\pi}{12}$

$x \in [0, 2\pi)$

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

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

$\cos 3x = 0$

$3x = \frac{\pi}{2}, \frac{3\pi}{2}, \frac{5\pi}{2}, \frac{7\pi}{2}, \frac{9\pi}{2}, \frac{11\pi}{2}$

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

82. $\cos 3x + \cos x = 0$

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

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

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

$\cos^3 x - \cos x \sin^2 x - 2\cos x \sin^2 x + \cos x = 0$

$\cos^3 x - 3\cos x \sin^2 x + \cos x = 0$

$\cos^3 x - 3\cos x(1 - \cos^2 x) + \cos x = 0$

$\cos^3 x - 3\cos x + 3\cos^3 x + \cos x = 0$

$4\cos^3 x - 2\cos x = 0$

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

$2\cos x = 0$

$\cos x = 0$

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

$2\cos^2 x - 1 = 0$

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

$\cos x = \pm\frac{1}{\sqrt{2}}$

$x = \frac{\pi}{4}, \frac{3\pi}{4}, \frac{5\pi}{4}, \frac{7\pi}{4}$

$\cos 2x = 1 - 3\sin x$

$1 - 2\sin^2 x = 1 - 3\sin x$

$3\sin x + 1 - 2\sin^2 x = 1$

$-1 \qquad -1$

$3\sin x - 2\sin^2 x = 0$

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

$\sin x = 0$

$x = 0, \pi$

$3 - 2\sin x = 0$

$3 = 2\sin x$

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