College Algebra

Name: Key

6.3 Practice Day 2

Date: _____ Period: _____

Solve each equation over the interval $[0^\circ, 360^\circ)$. If necessary, round answers to the nearest hundredths.

1.) $2\cos 2x \sin x + \cos 2x = 0$

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

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

$2x = 0 \qquad 2x = 270^\circ$

$\boxed{x = 0^\circ} \qquad \boxed{x = 135^\circ}$

$2x = 360 \qquad 2x = 630^\circ$

$\boxed{x = 180^\circ} \qquad \boxed{x = 315^\circ}$

$2x = 720$

$\cancel{x = 360^\circ}$

2.) $2\sin 2x = \sin 2x \cos x$

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

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

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

$\varnothing$

$2x = 0 \qquad 2x = 180^\circ$

$\boxed{x = 0^\circ} \qquad \boxed{x = 90^\circ}$

$2x = 360^\circ \qquad 2x = 540^\circ$

$\boxed{x = 180^\circ} \qquad \boxed{x = 270^\circ}$

3.) ~~$2\cos 2x \sin x + \sqrt{2}\cos 2x = 0$~~

$3\cot 2x \tan x + \sqrt{3}\cot 2x = 0$

$\cot 2x(3\tan x + \sqrt{3}) = 0$

$\cot 2x = 0 \qquad \tan x = -\frac{\sqrt{3}}{3}$

$2x = 90^\circ \qquad 2x = 270^\circ$

$\boxed{x = 45^\circ} \qquad \boxed{x = 135^\circ}$

$2x = 450^\circ \qquad 2x = 630$

$\boxed{x = 225^\circ} \qquad \boxed{x = 315^\circ}$

$\boxed{150^\circ}$

$\boxed{330^\circ}$

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

$\tan 4x \csc x - 2\tan 4x = 0$

$\tan 4x(\csc x - 2) = 0$

$\tan 4x = 0 \qquad \csc x = 2$

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

Solve each equation over the interval $[0,2\pi)$. If necessary, round answers to the nearest hundredths.

5.) $\sqrt{3}\tan\frac{x}{2}-1=0$

$\tan\frac{x}{2}=\frac{1}{\sqrt{3}}$

$\frac{x}{2}=\frac{\pi}{6}$ $\quad$ $\frac{x}{2}=\frac{7\pi}{6}$

$\boxed{x=\frac{\pi}{3}}$ $\quad$ $\cancel{x=\frac{7\pi}{3}}$

6.) $\sec 2x\sin x=\sqrt{2}\sin x$

$\sec 2x\sin x-\sqrt{2}\sin x=0$

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

$\sin x=0$ $\quad$ $\sec 2x=\sqrt{2}$

$\cos 2x=\frac{1}{\sqrt{2}}\left(\frac{\sqrt{2}}{2}\right)$

$\boxed{0,\ \pi}$

$2x=\frac{\pi}{4}$ $\quad$ $2x=\frac{7\pi}{4}$

$\boxed{x=\frac{\pi}{8}}$ $\quad$ $\boxed{x=\frac{7\pi}{8}}$

$2x=\frac{9\pi}{4}$ $\quad$ $2x=\frac{15\pi}{4}$

$\boxed{x=\frac{9\pi}{8}}$ $\quad$ $\boxed{x=\frac{15\pi}{8}}$

7.) $\sqrt{3}\cot x+2\cos\frac{x}{2}\cot x=0$

$\cot x\left(\sqrt{3}+2\cos\frac{x}{2}\right)=0$

$\cot x=0$ $\quad$ $\cos\frac{x}{2}=\frac{-\sqrt{3}}{2}$

$\boxed{\frac{\pi}{2},\ \frac{3\pi}{2}}$

$\frac{x}{2}=\frac{5\pi}{6}$ $\quad$ $\frac{x}{2}=\frac{7\pi}{6}$

$\boxed{x=\frac{5\pi}{3}}$ $\quad$ $\cancel{x=\frac{7\pi}{3}}$

8.) $(2\sin 3x-1)(\tan x+1)=0$

$\sin 3x=1/2$ $\quad$ $\tan x=-1$

$3x=\frac{\pi}{6}$ $\quad$ $3x=\frac{5\pi}{6}$

$\boxed{x=\frac{\pi}{18}}$ $\quad$ $\boxed{x=\frac{5\pi}{18}}$

$3x=\frac{13\pi}{6}$ $\quad$ $3x=\frac{17\pi}{6}$

$\boxed{x=\frac{13\pi}{18}}$ $\quad$ $\boxed{x=\frac{17\pi}{18}}$

$3x=\frac{25\pi}{6}$ $\quad$ $3x=\frac{29\pi}{6}$

$\boxed{x=\frac{25\pi}{18}}$ $\quad$ $\boxed{x=\frac{29\pi}{18}}$