Day 2

6.3

Solving Trig Equations with Multiple Angles

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Solve each equation over the interval [0°, 360°).

1.) $2\sin 3x\cos x+\sqrt{2}\sin 3x=0$

$2\sin\theta\cos x+\sqrt{2}\sin\theta=0$

$\sin\theta(2\cos x+\sqrt{2})=0$

$\sin\theta=0$

$\theta=0°, 180°$

$\frac{3x}{3}=0°/3, 180°/3$

$=360°/3, 540°/3$

$=720°/3, 900°/3$

$2\cos x+\sqrt{2}=0$

$\cos x=-\frac{\sqrt{2}}{2}$

$x=135°, 225°$

$x=0°, 60°, 120°, 180°, 240°, 300°, 135°, 225°$

Solve each equation over the interval [0, 2π).

2.) $2\cos 2x\tan x=\sqrt{3}\tan x$

$-\sqrt{3}\tan x$

$2\cos\theta\tan x-\sqrt{3}\tan x=0$

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

$\tan x=0$

$x=0, \pi,$

$\frac{\pi}{12}, \frac{11\pi}{12}, \frac{13\pi}{12}, \frac{23\pi}{12}$

$2\cos\theta-\sqrt{3}=0$

$+\sqrt{3}\quad +\sqrt{3}$

$\frac{2\cos\theta}{2}=\frac{\sqrt{3}}{2}$

$\cos\theta=\sqrt{3}/2$

$\theta=\frac{\pi}{6}, \frac{11\pi}{6}$

$\frac{2x}{2}=\frac{\pi}{6}\cdot\frac{1}{2}, \frac{11\pi}{6}\cdot\frac{1}{2}$

$=\frac{13\pi}{6}\cdot\frac{1}{2}, \frac{23\pi}{6}\cdot\frac{1}{2}$

$\frac{\pi}{6}+\frac{2\pi}{1}\cdot\frac{6}{6}$

$\frac{\pi}{6}+\frac{12\pi}{6}$