

Solve each equation in the indicated domain. $[0^\circ, 360^\circ)$.

1. $\sec(x+81^\circ) = 2$ $[0^\circ, 360^\circ)$
 $[81^\circ, 441^\circ)$
 $x+81^\circ = 300^\circ, 420^\circ$

$x = 219^\circ, 339^\circ$

2. $\sin 2x = \sqrt{2} \cos x$ $[0, 2\pi)$

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

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

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

$\cos x = 0$ $\sin x = \frac{\sqrt{2}}{2}$

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

3. $2 \sec^2 x - 3 \sec x - 2 = 0$ $[0, 2\pi)$

$(2 \sec x + 1)(\sec x - 2) = 0$

$\sec x = -\frac{1}{2}$ $\sec x = 2$

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

4. $\sin x = \sin 2x$ $[0, 2\pi)$

$\sin x = 2 \sin x \cos x$

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

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

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

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

5. $\cos 3x \cos 12^\circ - \sin 3x \sin 12^\circ = \frac{1}{2}$ $[0^\circ, 360^\circ)$

$\cos(3x+12^\circ) = \frac{1}{2}$ $[0^\circ, 1080^\circ)$
 $[12^\circ, 1092^\circ)$

$3x+12 = 60^\circ, 300^\circ, 420^\circ, 660^\circ, 780^\circ, 1020^\circ$

$3x = 48^\circ, 288^\circ, 408^\circ, 648^\circ, 768^\circ, 1008^\circ$

$x = 16^\circ, 96^\circ, 136^\circ, 216^\circ, 256^\circ, 336^\circ$