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Solve $4\sin x \cos 2x + 4\cos x \sin 2x - 1 = 0$

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

$$4\sin x \cdot \cos 2x + 4\cos x \cdot \sin 2x = 1$$

$$4(\underbrace{\sin x \cdot \cos 2x + \cos x \sin 2x}_{\sin(x+2x)}) = 1$$

$$4\sin 3x = 1$$

$$\sin 3x = \frac{1}{4} > 0$$

According to CAST

$$3x \in QI \text{ or } 3x \in QII$$

$$RAA = \sin^{-1}\left(\frac{1}{4}\right) \doteq 0.253$$

$$3x \doteq 0.253 \text{ or } 3x \doteq \pi - 0.253$$

$$3x \doteq 0.253 \text{ or } 3x \doteq 2.889$$

$$x \doteq 0.084 \text{ or } x \doteq 0.963$$

The smallest possible solution on the given domain, $0 \leq x \leq 2\pi$, is $x \doteq 0.08$ rad.