

$$\begin{aligned} \sin 4x - \cos 4x &= \sin 4x - \sin\left(\frac{\pi}{2} - 4x\right) = 2 \sin\left(4x - \frac{\pi}{4}\right) \cos\left(\frac{\pi}{4}\right) = \\ &= 2 \sin\left(4x - \frac{\pi}{4}\right) \frac{\sqrt{2}}{2} = \sqrt{2} \sin\left(4x - \frac{\pi}{4}\right) \end{aligned}$$

Answer: $\sin 4x - \cos 4x = \sqrt{2} \sin\left(4x - \frac{\pi}{4}\right)$;