Résoudre l'équation : $2\sin 2x \cdot \left(\cos^4 x - \sin^4 x\right) = \cos x$

Grâce aux produits remarquables, à la formule fondamentale de trigonométrie et aux formules de duplication, on a

$$\begin{aligned}
2\sin 2x \cdot \left(\cos^4 x - \sin^4 x\right) = \cos x &\iff 2\sin 2x \cdot \left(\cos^2 x - \sin^2 x\right) \cdot \left(\cos^2 x + \sin^2 x\right) = \cos x \\
&\iff 2\sin 2x \cdot \left(\cos^2 x - \sin^2 x\right) = \cos x \\
&\iff 2\sin 2x \cdot \cos 2x = \cos x \\
&\iff \sin 4x = \sin\left(\frac{\pi}{2} - x\right) \\
&\iff 4x = \frac{\pi}{2} - x + 2k\pi \qquad \text{ou} \qquad 4x = \pi - \left(\frac{\pi}{2} - x\right) + 2k\pi \\
&\iff x = \frac{\pi}{10} + \frac{2k\pi}{5} \qquad \text{ou} \qquad x = \frac{\pi}{6} + \frac{2k\pi}{3}
\end{aligned}$$

Finalement, les solutions principales sont $\boxed{Sol = \left\{\frac{\pi}{10}; \frac{\pi}{2}; \frac{9\pi}{10}; \frac{13\pi}{10}; \frac{17\pi}{10}; \frac{\pi}{6}; \frac{5\pi}{6}; \frac{3\pi}{2}\right\}}$.