Calculer $I = \displaystyle\int \frac{\cos 4x}{(\cot x - \tan x)^2}\, dx$.

En utilisant différentes formules de trigonométrie, on a

$$
\begin{aligned}
I &= \int \frac{\cos 4x}{(\cot x - \tan x)^2}\, dx \\
&= \int \frac{\cos 4x}{\left(\dfrac{\cos x}{\sin x} - \dfrac{\sin x}{\cos x}\right)^2}\, dx \\
&= \int \frac{\cos 4x}{\left(\dfrac{\cos^2 x - \sin^2 x}{\frac{1}{2}\sin 2x}\right)^2}\, dx \\
&= \frac{1}{4}\int \frac{\cos 4x \cdot \sin^2 2x}{\cos^2 2x}\, dx \\
&= \frac{1}{4}\int \frac{(2\cos^2 2x - 1)\cdot \sin^2 2x}{\cos^2 2x}\, dx \\
&= \frac{1}{4}\int \left(2\sin^2 2x - \tan^2 2x\right)\, dx \\
&= \frac{1}{4}\int \left(1 - \cos 4x + 1 - \frac{1}{\cos^2 2x}\right)\, dx \\
&= \frac{1}{4}\left(2x - \frac{1}{4}\sin 4x - \frac{1}{2}\tan 2x\right) + K \\
&= \boxed{\frac{x}{2} - \frac{1}{16}\sin 4x - \frac{1}{8}\tan 2x + K}
\end{aligned}
$$