

$$\begin{aligned}
86. \quad \frac{1}{2} \int \sin^4(2x) \cos^2(2x) 2 \, dx &= \frac{1}{2} \left[-\frac{\cos^3(2x) \sin^3(2x)}{6} + \frac{1}{2} \int \cos^2(2x) \sin^2(2x) 2 \, dx \right] \\
&= \frac{1}{2} \left[-\frac{\cos^3(2x) \sin^3(2x)}{6} + \frac{1}{2} \left(\frac{\cos^3(2x) \sin(2x)}{4} + \frac{1}{4} \int \cos^2(2x) 2 \, dx \right) \right] \\
&= -\frac{1}{12} \cos^3(2x) \sin^3(2x) - \frac{1}{16} \cos^3(2x) \sin(2x) + \frac{1}{18} \left(\frac{\cos(2x) \sin(2x)}{2} + \frac{2x}{2} \right) + C \\
&= -\frac{1}{96} \left(8 \cos^3(2x) \sin^3(2x) + 6 \cos^3(2x) \sin(2x) - 3 \cos(2x) \sin(2x) - 6x \right) + C
\end{aligned}$$