

Answer on Question #53129 – Math – Integral Calculus

Find the reduction formula of $\int \cos^8 x dx$.

Solution

$$\int \cos^8 x dx = \int \frac{1 + \cos^4 2x}{2} dx = \int \left(\frac{1}{2} + \frac{1 + \cos^2 4x}{4} \right) dx = \int \left(\frac{1}{2} + \frac{1}{4} + \frac{1 + \cos 8x}{8} \right) dx =$$
$$= \int \left(\frac{7}{8} + \frac{1}{8} \cos 8x \right) dx = \frac{7}{8} x + \frac{1}{64} \sin 8x + C = \frac{56 + \sin 8x}{64} + C,$$

where C is an arbitrary real constant.

Answer: $\frac{56 + \sin 8x}{64} + C.$