$$\int x \cos(5x)\, dx$$

Solution

Let $u = x$ and $dv = \cos(5x)\, dx$. Then $du = dx$ and $v = \frac{1}{5}\sin(5x)$ by substitution. So

$$\int x \cos(5x)\, dx = \frac{x}{5}\sin(5x) - \int \frac{1}{5}\sin(5x)\, dx = \frac{x}{5}\sin(5x) + \frac{1}{25}\cos(5x) + C$$

where the last integral was done by substitution of $5x$.