

1. Q — $\int 6x \cos(5x) dx$

A —

Let $u = x; v' = \cos(5x)$. Therefore $v = \frac{1}{5} \sin(5x)$

According to integration by parts:

$$\int uv' = uv - \int vu'$$

Therefore $\int 6x \cos(5x) dx = 6 \int x \cos(5x) dx = x \frac{6}{5} \sin(5x) - \int \frac{6}{5} \sin(5x) dx$

$$= x \frac{6}{5} \sin(5x) - \frac{6}{5} \int \sin(5x) dx$$

$$= x \frac{6}{5} \sin(5x) + \frac{6}{25} \cos(5x) + C$$