

1. Q — $\int x \cos(6x) dx$

A —

Let $u = x; v' = \cos(6x)$. Therefore $v = \frac{1}{6} \sin(6x)$

According to integration by parts:

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

Therefore $\int x \cos(6x) dx = x \frac{1}{6} \sin(6x) - \int \frac{1}{6} \sin(6x) dx$

$$= x \frac{1}{6} \sin(6x) - \frac{1}{6} \int \sin(6x) dx$$

$$= x \frac{1}{6} \sin(6x) + \frac{1}{36} \cos(6x) + C$$