

Question Three

$$(b) \int x \sin 4x \, dx$$

$$U \quad x$$

$$V \quad -\frac{1}{4} \cos 4x$$

$$\frac{dU}{dx} \quad 1$$

$$\frac{dV}{dx} \quad \sin 4x$$

$$x - \frac{1}{4} (\cos 4x) - \int \frac{1}{4} \cos 4x \, dx$$
$$+ \frac{1}{4} \int \cos 4x \, dx$$

$$\boxed{-\frac{x}{4} \cos 4x + \frac{1}{4} \left(\frac{1}{4} \sin 4x \right) + C}$$