

## 11.6) Integration by parts

## Worked example

Find:

$$\int x \sin x \, dx$$

## Your turn

Find:

$$\int x \cos x \, dx$$

$$x \sin x + \cos x + c$$

## Worked example

Find:

$$\int x^2 \cos x \, dx$$

## Your turn

Find:

$$\int x^2 \sin x \, dx$$

$$2x \sin x - x^2 \cos x + 2 \cos x + c$$

## Worked example

Find:

$$\int x^2 e^{-x} dx$$

## Your turn

Find:

$$\int x^2 e^x dx$$

$$x^2 e^x - 2x e^x + 2e^x + c$$

## Worked example

Find:

$$\int x^3 \ln x \, dx$$

## Your turn

Find:

$$\int x^2 \ln x \, dx$$

$$\frac{1}{3}x^3 \ln x - \frac{1}{9}x^3 + c$$

## Worked example

Evaluate:

$$\int_1^4 \ln x \, dx$$

## Your turn

Evaluate:

$$\int_1^2 \ln x \, dx$$
$$2 \ln 2 - 1$$

## Worked example

Find:

$$\int e^x \cos x \, dx$$

## Your turn

Find:

$$\int e^x \sin x \, dx$$

$$-\frac{1}{2}e^x \cos x + \frac{1}{2}e^x \sin x + c$$

## Worked example

Evaluate:

$$\int_0^{\frac{\pi}{2}} x \cos x \, dx$$

## Your turn

Evaluate:

$$\int_0^{\frac{\pi}{2}} x \sin x \, dx$$

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