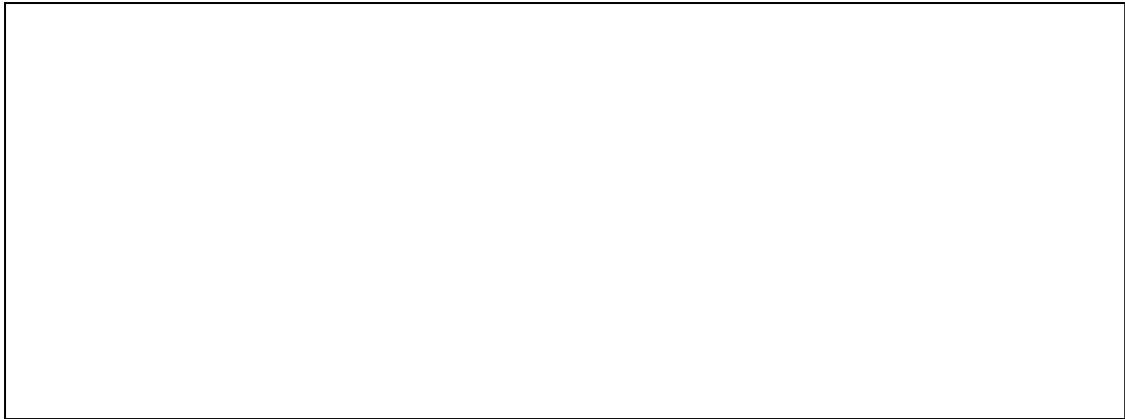1. Integrating Factors

Example

Find the general solution of $\frac{dy}{dx} - 4y = e^x$

Why do we use $e^{\int P\,dx}$?

Solve the general equation $\frac{dy}{dx} + Py = Q$, where P, Q are functions of x.

What happens when there's something on front of the dy/dx?

Examples

1. Find the solution of $x^2 \frac{dy}{dx} + xy = \frac{2}{x}$ when $y = 1$, $x = 2$

2. Find the general solution of $\cos x \frac{dy}{dx} + 2y \sin x = \cos^4 x$

<u>Test Your Understanding</u>

Find the general solution of the differential equation

$$x\frac{dy}{dx} + 5y = \frac{\ln x}{x}, \quad x > 0$$