

**1** Integrate the following:

(a)  $\int (1-x)dx$

(b)  $\int (3x^2 + 4x + 5)dx$

(c)  $\int (1-3x)^2 dx$

(d)  $\int \left(x - \frac{1}{x}\right)^2 dx$

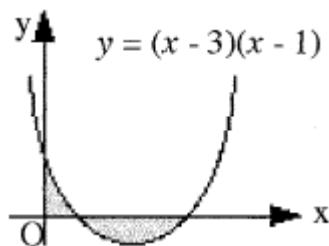
(e)  $\int \frac{x^2 + 2}{\sqrt{x}} dx$

**2** Find the particular solution of the differential equation  $\frac{dy}{dx} = 3x^2 - 10x$ , given  $(-1,0)$ .

**3** Evaluate  $\int_1^3 \left(x^2 - \frac{1}{x^2}\right) dx$

**4** Find the value of  $c$  if  $\int_8^c x^{-\frac{2}{3}} dx = 3$ .

**5** Find the shaded area.



**6** (a) Sketch the following pair of curves on the same diagram.

$$y = x^2 - 2x \text{ and } y = 6x - x^2$$

(b) Calculate the area of the region enclosed by the curves.