Differentiation

Finding gradient:

Basic Differentiation:

From first principle:

Exercise:

For each of these functions of x, find the gradient function.

(i) $y = x^5$ **(ii)** $z = 7x^6$ **(iii)** $p = 11$ **(iv)** $f(x) = \frac{3}{x}$

Differentiate $y = 3x^2 + 4x^3$.

Differentiate $f(x) = \frac{(x^2+1)(x-5)}{x}$

Differentiation in context:

Given that $y = \sqrt{x} - \frac{8}{x^2}$, find

(i) $\frac{dy}{dx}$

(ii) the gradient of the curve at the point $\left(4, 1\frac{1}{2}\right)$.

Figure 5.10 shows the graph of

$$y = x^2(x-6) = x^3 - 6x^2.$$

Find the gradient of the curve at the points A and B where it meets the x axis.

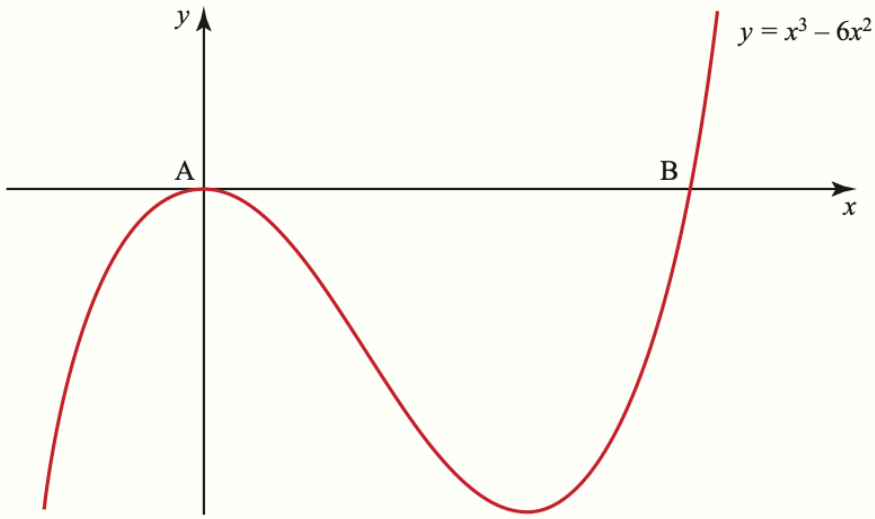

Figure 5.10

Find the points on the curve with equation $y = x^3 + 6x^2 + 5$ where the value of the gradient is -9.