

(66) Differentiation (Quadratic Expression)

WORKING AT D/E

(1) Find a simplified expression for $\frac{dy}{dx}$ for each quadratic equation:

(a) $y = x^2 + 3x$ (b) $y = x^2 - 2x + 4$
(c) $y = -x^2 + 6x - 3$ (d) $y = 4x^2 - 3x$

(2) Find an expression for $f'(x)$ for each of the following quadratic equations:

(a) $f(x) = 5x^2 - x$ (b) $f(x) = -3x^2 + 2$

(3) Given that $f(x) = 4x^2 + 2x - 7$

(a) Find the gradient of the curve $y = f(x)$ when $x = 2$

(b) Find the value of x when $f'(x) = 34$

WORKING AT B/C

(1) Find a simplified expression for $\frac{dy}{dx}$ for each equation:

(a) $y = x(x - 4)$ (b) $y = (x - 3)(x + 4)$
(c) $y = (2x - 1)(3x + 5)$ (d) $y = (x - 3)^2$

(2) Find an expression for $g'(x)$ for each of the following equations:

(a) $g(x) = 6x(x - 4)$ (b) $g(x) = (4x - 3)^2$

(3) Given that $y = (4 - 5x)^2$ find the value x for which $\frac{dy}{dx} = 5$

WORKING AT A*/A

(1) $f(x) = x^2 + px + q$

Given that $f(2) = 18$ and $f(-3) = -27$

(a) Find the value of the constants p and q .

The curve with equation $y = f(x)$ has gradient -8 at the point (a, b)

(b) Find the value of a and the value of b .

(c) Find the coordinates of the point where the tangent to the curve is parallel to the line $y = 0$

(2) The graph of $x = 4t^2 - 8t$ at the point (p, q) has gradient -40 .

Find the value of p and the value of q .

(3) Find the coordinates of the point on the graph of $y = -(2 - 3x)^2$ where the gradient is 6