

Section 1: Introduction to integration

Exercise level 2

1. The gradient function of a curve is given by $\frac{dy}{dx} = 4x^2 + x$.

(i) Find the equation of the curve given that $y = 2$ when $x = 1$.

(ii) Find the value of y when $x = 3$.



2. The gradient of a curve at the point (x, y) is given by $4(1 - x)$. Given that the curve has a maximum value of 8, find the equation of the curve.

3. Find an expression for y in terms of x if $\frac{dy}{dx} = (x - 1)(3x - 5)$ and $y = 2$ when $x = 1$.



4. A curve with gradient function $\frac{dy}{dx} = 4x^2 - 1$ has a local minimum value of 1. Find the equation of the curve and the coordinates of the local maximum value.

5. A curve has gradient function $\frac{dy}{dx} = 3x^2 - 2x + k$

(i) It has a maximum point at $x = -2$. Find the value of k .

(ii) The curve passes through the point $(1, 3)$. Find the equation of the curve.