1 Power Rule

1.1 The derivative

1. Find $\frac{dy}{dx}$ for

   (i) $y = 3\sqrt{x}$ (ii) $y = \sqrt{3x}$ (iii) $y = \frac{3}{\sqrt{x}}$

   (iv) $y = \frac{1}{3\sqrt{x}}$ (v) $y = x^4 - \frac{1}{x^4}$ (vi) $y = 4x^{1/6} + \pi^3$

   (vii) $y = 4x^2 - 5x + 6$ (viii) $y = 2x^3 + 7x^2 + 9x - 1$

2. Find the slope of the curve $y = 5x^2 + x - 3$ at the point:

   (i) $(-1, 1)$ (ii) $(2, 19)$.

3. Find $\frac{dy}{dx}$ for

   (i) $y = 2\sqrt{x}$ (ii) $y = \sqrt{2x}$ (iii) $y = \frac{2}{\sqrt{x}}$

   (iv) $y = \frac{1}{2\sqrt{x}}$ (v) $y = x^3 - \frac{1}{x^2}$ (vi) $y = 6x^{2/3} + \sqrt{3}$

   (vii) $y = 7x^2 - 9x + 8$ (viii) $y = 3x^3 - 7x^2 + 10x - 1$

4. Find the slope of the curve $y = 7x^2 - 4x - 6$ at the point:

   (i) $(-1, 5)$ (ii) $(2, 14)$.