Introduction to Calculus
Gradients of Curves - Power Rule for Differentiation

Worksheet 3

Answer Key

Exercise 1

1. $\dfrac{dy}{dx} = 2x$

2. Gradient at $A\,(-3,5)$ is equal to $\dfrac{dy}{dx}$ when $x = -3$, that's: $\dfrac{dy}{dx} = -6$

3. Gradient at $B\,(1,-3)$ is equal to $\dfrac{dy}{dx}$ when $x = 1$, that's: $\dfrac{dy}{dx} = 2$

Exercise 2

1. Domain $= \mathbb{R}^*$, that's all real numbers excluding 0. Simply writing $x \neq 0$ may also accepted.

2. $\dfrac{dy}{dx} = 1 - \dfrac{1}{x^2}$

3. When $x = -1$ we find $\dfrac{dy}{dx} = 0$.

Exercise 3

1. $\dfrac{dy}{dx} = 4x - 4$

2. When $x = 3$ we find $y = 8$, so point P has coordinates $P\,(3,8)$.

3. When $x = 3$ we find $\dfrac{dy}{dx} = 8$.

Exercise 4

1. $\dfrac{dy}{dx} = 3 + \dfrac{8}{x^3}$

2. When $x = -1$ we find $\dfrac{dy}{dx} = -5$

3. When $x = 2$ we find $\dfrac{dy}{dx} = 4$