Differentiation
Products and Quotients

1. $y = (2x - 1)(3x + 2)$. Calculate $\frac{dy}{dx}$ when $x = 2$.

2. $f(x) = \frac{x^3 - 2x^2}{x}$. Calculate $f'(-3)$.

3. $f(x) = \left(2x - \frac{4}{x}\right)^2$. Calculate the value of $f'(-2)$.

4. $y = \left(\sqrt{x} + \frac{1}{\sqrt{x}}\right)^2$. Calculate $\frac{dy}{dx}$ when $x = 3$.

5. $f(x) = \frac{x^3 - 1}{\sqrt{x}}$. Calculate the value of $f'(4)$.

6. $y = \frac{2x - x^2}{\sqrt[3]{x}}$. Calculate $\frac{dy}{dx}$ when $x = 8$.

7. $f(x) = \frac{4}{x^2} + x\sqrt{x}$. Find the value of $f'(4)$.

8. $f(x) = x^4 - \frac{16}{\sqrt{x}}$. Calculate $f'(1)$.

9. $y = \frac{\sqrt{x} - x}{x^2}$. Calculate the value of $\frac{dy}{dx}$ when $x = 4$.

10. $f(x) = \frac{(x^2 + 1)^2}{\sqrt{x}}$. Find $f'(1)$.

11. $f(x) = \frac{x^3 - 4x}{x^2\sqrt{x}}$. Find the value of $f'(4)$

12. $y = \frac{x^2 - x}{\sqrt[4]{x^3}}$. Find $\frac{dy}{dx}$ when $x = 16$.