Differentiation – Quotients

1. $y = \frac{3}{x}$. Find the value of $\frac{dy}{dx}$ when x = 1.

2. $f(x) = \frac{24}{\sqrt{x}}$. Calculate $f'(4)$.

3. $y = \frac{1}{4x^3}$. Find $\frac{dy}{dx}$

4. $y = x - \frac{16}{\sqrt{x}}$. Calculate the value of $\frac{dy}{dx}$ when x is replaced by 4.

5. $f(x) = \sqrt[3]{x} - \frac{1}{\sqrt{x}}$. Find $f'(x)$.

6. $f(x) = \sqrt{x} + \frac{2}{x^2}$. Calculate $f'(4)$.

7. $f(x) = \frac{4x - 1}{x^2}$. Find $f'(x)$.

8. $y = \frac{x - 2}{x^2}$. Calculate $\frac{dy}{dx}$ when x = 2.

9. $f(x) = \frac{x^2 + 32}{\sqrt{x}}$. Find $f'(16)$.

10. $y = \frac{x^2 - x^3}{\sqrt{x}}$. Find the value of $\frac{dy}{dx}$ when x = 4.

11. $y = 3x^2 + \frac{6}{\sqrt[3]{x}}$. Calculate $\frac{dy}{dx}$.

12. $f(x) = \frac{8x - 2x^4}{x\sqrt{x}}$. Find the value of $f'(4)$.

13. $y = \frac{10 + 3x}{5\sqrt{x}}$. Find $\frac{dy}{dx}$.

14. $f(x) = \frac{3\sqrt{3}}{2}\left(x^2 + \frac{16}{x}\right)$.

    (a) Find $f'(x)$.

    (b) Show that if $f'(x) = 0$ then x = 2.