



Air maths tuition

Interact, engage and perform

Differentiation 3

$$\begin{aligned} y &= \frac{5x^3 - 7x - 1}{3x^2} \\ &= \frac{1}{3x^2} (5x^3 - 7x - 1) \\ &= \frac{x^{-2}}{3} (5x^3 - 7x - 1) \\ &= \frac{5x}{3} - \frac{7x^{-1}}{3} - \frac{x^{-2}}{3} \\ \therefore \frac{dy}{dx} &= \frac{5}{3} + \frac{7}{3}x^{-2} + \frac{2}{3}x^{-3} \\ &= \frac{5}{3} + \frac{7}{3}\left(\frac{1}{x^2}\right) + \frac{2}{3}\left(\frac{1}{x^3}\right) \\ &= \frac{5}{3} + \frac{7}{3x^2} + \frac{2}{3x^3} \end{aligned}$$
$$\begin{aligned} y &= \frac{5x^3 - 7x - 1}{3x^2} \quad \left| \quad x^{-n} = \frac{1}{x^n} \right. \\ &= \frac{5x^3}{3x^2} - \frac{7x}{3x^2} - \frac{1}{3x^2} \\ &= \frac{5x}{3} - \frac{7x^{-1}}{3} - \frac{x^{-2}}{3} \\ &\quad \left. \begin{array}{l} \text{and so on} \end{array} \right\} \end{aligned}$$

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