

Find the value(s) of x for which the graph $y = x^3 - 8x + 2$ has gradient 4

$$y = x^3 - 8x + 2$$

Use the power rule to differentiate each of the terms

$$\frac{d}{dx}(ax^n) = anx^{n-1}$$

$$\frac{dy}{dx} = 3x^2 - 8$$

$$\text{Solve } \frac{dy}{dx} = 4$$

$$3x^2 - 8 = 4$$

$$3x^2 = 12$$

$$x^2 = 4$$

$$x = \pm 2$$