



Air maths tuition

Interact, engage and perform

Stationary Points - Nature of (2nd differential method)

Rate of change of gradient = $\frac{d}{dx} \left(\frac{dy}{dx} \right) = \frac{d^2y}{dx^2}$

$y = x^3 + 3x^2 - 9x - 1$ $\therefore \frac{dy}{dx} = 3x^2 + 6x - 9$ when $\frac{dy}{dx} = 0$ $\therefore 3x^2 + 6x - 9 = 0$ $\therefore x^2 + 2x - 3 = 0$ $\therefore (x+3)(x-1) = 0$ $\therefore x = -3 \text{ or } x = 1$	Now $\frac{d^2y}{dx^2} = 6x + 6$ when $x = -3$ $\frac{d^2y}{dx^2} = -12 < 0 \therefore \text{max}$ when $x = 1$ $\frac{d^2y}{dx^2} = 12 > 0 \therefore \text{min}$	

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