

Higher Maths 2019 Paper 1

$$\textcircled{1} \quad \frac{dy}{dx} = 2x^3 - 6x^2$$

For S.P's $\frac{dy}{dx} = 0,$

$$2x^3 - 6x^2 = 0$$

$$2x^2(x - 3) = 0$$

$$2x^2 = 0$$

$$x = 0$$

$$\underline{\underline{\quad}}$$

$$x - 3 = 0$$

$$x = 3$$

$$\underline{\underline{\quad}}$$

Marking instructions for each question

Question			Generic scheme	Illustrative scheme	Max mark
1.			•¹ start to differentiate •² complete derivative and equate to 0 •³ factorise derivative •⁴ process cubic for x	•¹ $2x^3 \dots$ or $\dots - 6x^2$ •² $2x^3 - 6x^2 = 0$ •³ $2x^2(x - 3)$ •⁴ 0 and 3	4
Notes:					
1. • ² is only available if '=0' appears at either • ² or • ³ stage, however see Candidate A. 2. Accept $2x^3 = 6x^2$ for • ² . 3. Accept $x^2(2x - 6)$ for • ³ . 4. For candidates who divide by x or x^2 throughout see Candidate B. 5. • ³ is available to candidates who factorise their derivative from • ² as long as it is of equivalent difficulty. 6. $x = 0$ and $x = 3$ must be supported by valid working for • ⁴ to be awarded.					
Commonly Observed Responses:					
Candidate A Stationary points when $\frac{dy}{dx} = 0$ $\frac{dy}{dx} = 2x^3 - 6x^2$ • ¹ ✓ • ² ✓ $\frac{dy}{dx} = 2x^2(x - 3)$ • ³ ✓ $x = 0$ and $x = 3$ • ⁴ ✓			Candidate B $2x^3 - 6x^2 = 0$ • ¹ ✓ • ² ✓ $2x^3 = 6x^2$ • ³ ^ $x = 3$ • ⁴ x Dividing by x^2 is not valid as $x = 0$ is a solution.		