Higher Maths 2019
Paper 1

(1) $\frac{dy}{dx} = 2x^3 - 6x^2$

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

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

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

$2x^2 = 0$ $\qquad$ $x - 3 = 0$

$x = 0$ $\qquad$ $x = 3$

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 $2x^3\ldots$ or $\ldots -6x^2$ •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 ✗

Dividing by x^2 is not valid as $x=0$ is a solution.