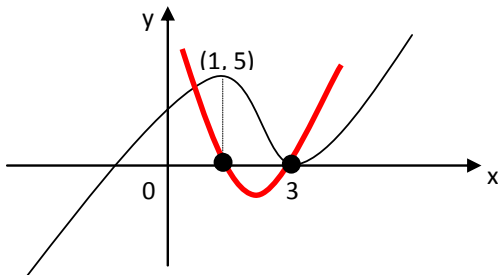
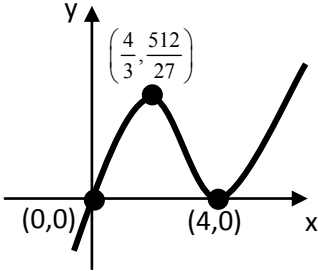


Differentiation 2 Homework - Marking Scheme

Question	Main points of expected responses	
1 (a)	Format Correct differentiation	<ul style="list-style-type: none"> •¹ $2x^2 + 12x + 18$ •² $4x + 12$
1 (b)	Format Correct differentiation	<ul style="list-style-type: none"> •³ $x - 1$ •⁴ 1
1 (c)	Format Correct differentiation	<ul style="list-style-type: none"> •⁵ $x + 2x^{-2}$ •⁶ $1 - 4x^{-3}$ OR $1 - \frac{4}{x^3}$
2	Correct Differentiation Substitution and solution for a Substitution solution for b	<ul style="list-style-type: none"> •¹ $\frac{dy}{dx} = 2ax$ •² $2a \times 3 = 30 \quad a = 5$ •³ $1 = 5 \times 3^2 + b$ •⁴ $b = -44$
3	Correct Differentiation Derivative less than 0 Factorisation Solution	<ul style="list-style-type: none"> •¹ $6x^2 + 6x - 12$ •² $f'(x) < 0$ •³ $(x + 2)(x - 1)$ •⁴ $-2 < x < 1$
4	Correct shape of graph Annotation	<ul style="list-style-type: none"> •¹  •²
5	Format for differentiation Correct Differentiation Statement for Turning Points Factorisation Solution for x Nature	<ul style="list-style-type: none"> •¹ $2x^3 - 16x^2 + 32x$ •² $\frac{dy}{dx} = 6x^2 - 32x + 32$ •³ $\frac{dy}{dx} = 0$ •⁴ $(3x - 4)(x - 4) = 0$ •⁵ $x = \frac{4}{3} \quad x = 4$ •⁶ Nature Table

Differentiation 2 Homework - Marking Scheme

5	<p>Both coordinates Correct shape</p> <p>Annotation - all coordinates needed for mark</p>	<ul style="list-style-type: none"> •7 Max TP $\left(\frac{4}{3}, \frac{512}{27}\right)$ Mini TP $(4, 0)$ •8 •9 
6	<p>Midpoint</p> <p>Perpendicular Gradient</p> <p>Equation</p> <p>Midpoint</p> <p>Perpendicular Gradient</p> <p>Equation</p> <p>Evidence of Sim. Equations</p> <p>Intersection Point</p>	<ul style="list-style-type: none"> •1 $M_{QR} = (0, -1)$ •2 $M_{\perp} = -3$ should state $m_1 \cdot m_2 = -1$ •3 $y + 1 = -3(x - 0)$ •4 $M_{PR} = (2.5, 1.5)$ •5 $M_{\perp} = \frac{1}{3}$ should state $m_1 \cdot m_2 = -1$ •6 $y - 1.5 = \frac{1}{3}(x - 2.5)$ •7 $y + 3x = -1$ $3y - x = 2$ •8 $\left(-\frac{1}{2}, \frac{1}{2}\right)$

Total 33 marks