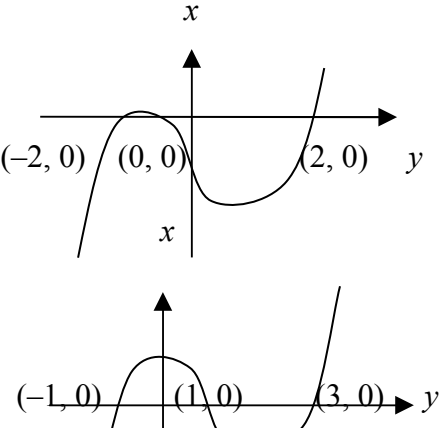


Question number	Scheme	Marks
1.	$10 + x^2 > x^2 - 2x$ $10 > -2x \quad x > -5$	B1 M1 A1 (3 marks)
2.	$\frac{x^3}{3} - \frac{x^{-1}}{-1} + \frac{x^{\frac{4}{3}}}{\frac{4}{3}}$ (A1 for 2 terms correct, A1 for all correct) $= \frac{x^3}{3} + x^{-1} + \frac{3x^{\frac{4}{3}}}{4} + C$	M1 A1 A1 B1 (for C) (4 marks)
3. (a) (b) (c)	9 $81^{\frac{1}{4}} = 3 \quad 3^3 = 27$ $\frac{1}{27}$	B1 (1) M1 A1 (2) B1 ft (1) (4 marks)
4. (a) (b) (c)	$4k - 7$ $4(4k - 7) - 7 = 16k - 35$ $16k - 35 = 13 \quad k = 3$	B1 M1 A1 (2) M1 A1 (2) (5 marks)
5. (a) (b)	$y = 8 - 2x \quad 3x^2 + x(8 - 2x) = 1$ $x^2 + 8x - 1 = 0 \quad (*)$ $x = \frac{-8 \pm \sqrt{64 + 4}}{2} = -4 \pm \dots$ $\sqrt{68} = 2\sqrt{17}; x = -4 + 2\sqrt{17} \text{ or } x = -4 - 2\sqrt{17}$ $y = 8 - 2(-4 + \sqrt{17}) = 16 - 2\sqrt{17} \text{ or } y = 16 + 2\sqrt{17}$	M1 A1 (2) M1 A1 B1 M1 A1 (5) (7 marks)

Question number	Scheme	Marks
<p>6. (a)</p> <p>(b)</p> <p>(c)</p>	$\frac{(2x+1)(x+4)}{\sqrt{x}} = \frac{2x^2+9x+4}{\sqrt{x}} = 2x^{\frac{3}{2}} + 9x^{\frac{1}{2}} + 4x^{-\frac{1}{2}} \quad [P=2, Q=9, R=4]$ $f'(x) = 3x^{\frac{1}{2}} + \frac{9}{2}x^{-\frac{1}{2}} - 2x^{-\frac{3}{2}} \quad (\text{A1 ft for one term, fractional power})$ <p>Gradient of tangent = $f'(1) = 3 + \frac{9}{2} - 2 = \frac{11}{2}$</p> <p>Gradient of line = $\frac{11}{2}$, equal gradients, \therefore parallel.</p>	<p>M1 A2(1, 0) (3)</p> <p>M1 A1 ft A1 (3)</p> <p>M1 A1 ft</p> <p>A1 (3)</p> <p>(9 marks)</p>
<p>7.</p> 	<p>$x, (x-2)(x+2)$</p> <p>Shape Through origin -2 and 2</p> <p>Curve translated +1 parallel to x-axis -1, 1 and 3 (B1 ft for one value)</p>	<p>B1, M1 A1 (3)</p> <p>B1</p> <p>B1 (dep.)</p> <p>B1 (3)</p> <p>B1 ft</p> <p>B1 ft B1 (3)</p> <p>(9 marks)</p>
<p>8. (a)</p> <p>(b)</p> <p>(c)</p>	<p>Gradient of l_2 is $-\frac{1}{3}$</p> $y-2 = -\frac{1}{3}(x-6) \quad y = -\frac{1}{3}x + 4$ $-\frac{1}{3}x + 4 = 3x - 6 \quad x = 3$ $y = 3 \quad l_1: x = 2 \quad l_2: x = 12$ <p>(2, 0), (12, 0), (3, 3) Area of triangle = $\frac{1}{2}(10 \times 3) = 15$</p>	<p>B1</p> <p>M1 A1 ft (3)</p> <p>M1 A1</p> <p>A1 ft (3)</p> <p>B1 B1 ft</p> <p>M1 A1 (4)</p> <p>(10 marks)</p>

Question number	Scheme	Marks
<p>9. (a)</p> <p>(b)</p>	$S = a + (a+d) + \dots + [a + (n-1)d]$ $S = [a + (n-1)d] + \dots + a$ <p>Add: $2S = n[2a + (n-1)d], \quad S = \frac{1}{2}n[2a + (n-1)d] \quad (*)$</p> $a + 15d = 6$ $\frac{1}{2}n[2a + (n-1)d] = 8 \quad (2a + 15d) = 72$	<p>B1</p> <p>M1</p> <p>M1 A1 (4)</p> <p>B1</p> <p>M1 A1</p>

(c)	Solve simultaneously: $a = 3$ $a = 3: 15d = 6 - 3 = 3$ $d = 0.2$	3cm M1 A1 (5) M1 A1 (2) (11 marks)
10. (a) (b) (c) (d)	$\frac{d^2y}{dx^2} = 3x^2 + 2$ Since x^2 is always positive, $\frac{d^2y}{dx^2} \geq 2$ for all x . $y = \frac{x^4}{4} + x^2 - 7x + (k)$ $4 = \frac{2^4}{4} + 2^2 - 14 + k$ $k = 10$ $y = \frac{x^4}{4} + x^2 - 7x + 10$ $x = 2: \frac{dy}{dx} = 8 + 4 - 7 = 5$ Gradient of normal = $-\frac{1}{5}$ $y - 4 = -\frac{1}{5}(x - 2)$ $x + 5y - 22 = 0$	M1 A1 (2) B1 (1) [k not required here] M1 A2 (1, 0) M1 A1 (5) M1 A1 M1 M1 A1 (5) (13 marks)

Specification/Assessment Objective grid
C1 Mock Paper

Qn	Spec Ref	AO1	AO2	AO3	AO4	AO5
1	1.7	2	1			
2	1.1, 5.1, 5.2	3	1			
3	1.1	3				1
4	3.1	3	2			
5	1.6, 1.2, 1.5	4	1			2
6	1.1, 1.8, 4.1, 4.2, 4.3	4	3	2		
7	1.8, 1.9, 1.10	3	2	4		
8	2.1, 2.2	3	5	2		
9	3.2	3	4		4	
10	5.1, 5.2, 4.1, 4.2, 4.3	5	7		1	
		33	26	8	5	3