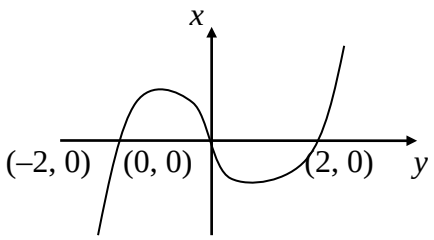
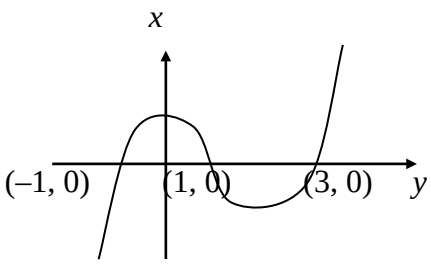
Question number		Scheme	Marks
1.		$10 + x^2 > x^2 - 2x$ $10 > -2x \qquad x > -5$	B1 M1 A1 **(3 marks)**
2.		$\frac{x^3}{3} - \frac{x^{-1}}{-1} + \frac{x^{\frac{4}{3}}}{\frac{4}{3}}$ (A1 for 2 terms correct, A1 for all correct) $= \frac{x^3}{3} + x^{-1} + \frac{3x^{\frac{4}{3}}}{4} + C$	M1 A1 A1 B1 (for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

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

Question number		Scheme	Marks
9.	(a)	$S = a + (a + d) + \ldots.. + [a + (n - 1)d]$	B1
		$S = [a + (n - 1)\, d] + \ldots\ldots\ldots\ldots + a$	M1
		Add: $2S = n[2a + (n - 1)d]$, $S = \frac{1}{2}n[2a + (n - 1)d]$ (*)	M1 A1 (4)
	(b)	$a + 15d = 6$	B1
		$\frac{1}{2}n[2a + (n - 1)d] = 8\ (2a + 15d) = 72$	M1 A1
		Solve simultaneously: $a = 3$ 3cm	M1 A1 (5)
	(c)	$a = 3$: $15d = 6 - 3 = 3$ $d = 0.2$	M1 A1 (2)
			(11 marks)
10.	(a)	$\frac{\mathrm{d}^2y}{\mathrm{d}x^2} = 3x^2 + 2$	M1 A1 (2)
	(b)	Since x^2 is always positive, $\frac{\mathrm{d}^2y}{\mathrm{d}x^2} \geq 2$ for all x.	B1 (1)
	(c)	$y = \frac{x^4}{4} + x^2 - 7x + (k)$ [k not required here]	M1 A2 (1, 0)
		$4 = \frac{2^4}{4} + 2^2 - 14 + k$ $k = 10$ $y = \frac{x^4}{4} + x^2 - 7x + 10$	M1 A1 (5)
	(d)	$x = 2$: $\frac{\mathrm{d}y}{\mathrm{d}x} = 8 + 4 - 7 = 5$	M1 A1
		Gradient of normal $= -\frac{1}{5}$	M1
		$y - 4 = -\frac{1}{5}(x - 2)$ $x + 5y - 22 = 0$	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**