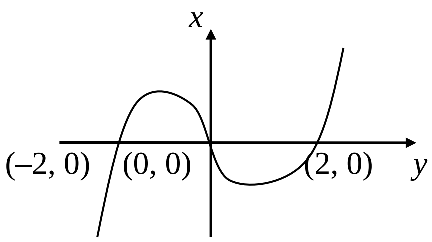
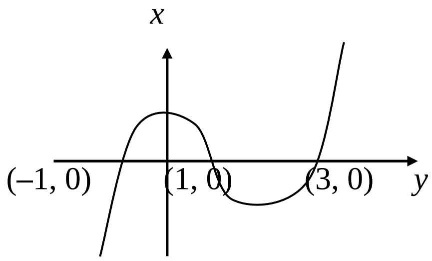
Question number	Scheme	Marks
1.	$10 + x^2 > x^2 - 2x$	B1
	$10 > -2x \qquad x > -5$	M1 A1
		(3 marks)
2.	$\frac{x^3}{3} - \frac{x^{-1}}{-1} + \frac{x^{\frac{4}{3}}}{\frac{4}{3}}$ (A1 for 2 terms correct, A1 for all correct)	M1 A1 A1
	$= \frac{x^3}{3} + x^{-1} + \frac{3x^{\frac{4}{3}}}{4} + C$	B1 (for 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)	$y = 8 - 2x \qquad 3x^2 + x(8 - 2x) = 1$	M1
	$x^2 + 8x - 1 = 0$ (*)	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)	$\dfrac{(2x+1)(x+4)}{\sqrt{x}} = \dfrac{2x^2+9x+4}{\sqrt{x}} = 2x^{\frac{3}{2}}+9x^{\frac{1}{2}}+4x^{-\frac{1}{2}}$ [P = 2, Q = 9, R = 4]	M1 A2(1, 0) (3)
(b)	$f'(x) = 3x^{\frac{1}{2}}+\dfrac{9}{2}x^{-\frac{1}{2}}-2x^{-\frac{3}{2}}$ (A1 ft for one term, fractional power)	M1 A1 ft A1 (3)
(c)	Gradient of tangent = $f'(1) = 3 + \dfrac{9}{2} - 2 = \dfrac{11}{2}$	M1 A1 ft
	Gradient of line = $\dfrac{11}{2}$, 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 $-\dfrac{1}{3}$	B1
	$y - 2 = -\dfrac{1}{3}(x-6)$ $\quad$ $y = -\dfrac{1}{3}x + 4$	M1 A1 ft (3)
(b)	$-\dfrac{1}{3}x + 4 = 3x - 6$ $\quad$ $x = 3$	M1 A1
	$y = 3$	A1 ft (3)
(c)	$y = 0$; $\quad$ l_1: $x = 2$ $\quad$ l_2: $x = 12$	B1 B1 ft
	(2, 0), (12, 0), (3, 3) $\quad$ Area of triangle = $\dfrac{1}{2}(10 \times 3) = 15$	M1 A1 (4)
		(10 marks)

Question number	Scheme	Marks
9. (a)	$S = a + (a + d) + \ldots + [a + (n-1)d]$	B1
	$S = [a + (n-1)d] + \ldots\ldots\ldots + a$	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)	$\frac{d^2y}{dx^2} = 3x^2 + 2$	M1 A1 (2)
(b)	Since x^2 is always positive, $\frac{d^2y}{dx^2} \geq 2$ 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)	$x = 2$: $\frac{dy}{dx} = 8 + 4 - 7 = 5$	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**