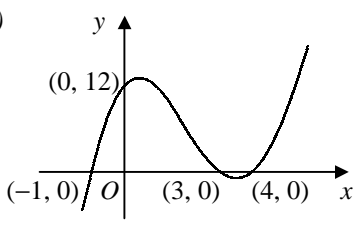
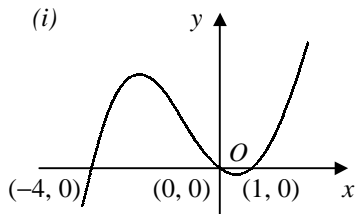
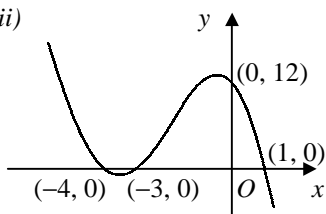


C1 Paper A – Marking Guide

1.	$(2^2)^{y+3} = 2^3$ $2y + 6 = 3$ $y = -\frac{3}{2}$	M1 M1 A1	(3)
2.	$= \frac{2}{3\sqrt{5}+7} \times \frac{3\sqrt{5}-7}{3\sqrt{5}-7}$ $= \frac{6\sqrt{5}-14}{45-49} = \frac{7}{2} - \frac{3}{2}\sqrt{5}$	M1 M1 A1	(3)
3.	(i) $x^2 + (y-3)^2 - 9 - 7 = 0$ \therefore centre (0, 3) (ii) $x^2 + (y-3)^2 = 16$ \therefore radius = 4	M1 A1 M1 A1	(4)
4.	(i) $= (x+3)^2 - 9 + 7$ $= (x+3)^2 - 2$ (ii) (-3, -2)	M1 A2 B2	(5)
5.	$x + y = 2 \Rightarrow y = 2 - x$ sub. into $3x^2 - 2x + y^2 = 2$ $3x^2 - 2x + (2-x)^2 = 2$ $2x^2 - 3x + 1 = 0$ $(2x-1)(x-1) = 0$ $x = \frac{1}{2}, 1$ $\therefore x = \frac{1}{2}, y = \frac{3}{2}$ or $x = 1, y = 1$	M1 M1 A1 M1 A1 M1 A1	(7)
6.	(i) $3x - x^{\frac{3}{2}} = 0$ $x(3 - x^{\frac{1}{2}}) = 0$ $x = 0$ (at O) or $x^{\frac{1}{2}} = 3$ $x = 3^2 = 9$ (ii) $\frac{dy}{dx} = 3 - \frac{3}{2}x^{\frac{1}{2}}$ for SP, $3 - \frac{3}{2}x^{\frac{1}{2}} = 0$ $x^{\frac{1}{2}} = 2$ $x = 4$ $\therefore (4, 4)$	M1 M1 A1 M1 A1 M1 A1 A1	(8)
7.	(i) $= (-6)^2 - (4 \times 1 \times 12) = -12$ (ii) 0 real roots \therefore graph of $y = x^2 - 6x + 12$ doesn't cross the x -axis and coeff. of x^2 is positive so curve has a minimum which must be above x -axis hence, $x^2 - 6x + 12$ is always positive (iii) $x^2 - 6x + 12 = 8 - 2x$ $x^2 - 4x + 4 = 0$ $(x-2)^2 = 0$ repeated root \therefore tangent	M1 A1 B1 B2 M1 A1 M1 A1	(9)

8. (a) LHS = $(x + 1)(x^2 - 7x + 12)$
 $= x^3 - 7x^2 + 12x + x^2 - 7x + 12$
 $= x^3 - 6x^2 + 5x + 12 = \text{RHS}$ M1
A1
- (b)  B3
- (c) (i)  (ii)  B2 B2

(9)

9. (i) $\frac{dy}{dx} = \frac{1}{2} + x^{-2}$ M1 A1
grad = $\frac{1}{2} + 2^{-2} = \frac{3}{4}$ M1 A1
- (ii) $x = 2 \therefore y = \frac{7}{2}$ B1
 $y - \frac{7}{2} = \frac{3}{4}(x - 2)$ M1
 $4y - 14 = 3x - 6$
 $3x - 4y + 8 = 0$ A1
- (iii) at B, grad = $\frac{3}{4}$
 $\therefore \frac{1}{2} + x^{-2} = \frac{3}{4}$ M1
 $x^2 = 4$
 $x = 2$ (at A), -2 A1
 $\therefore B(-2, \frac{5}{2})$ A1 (10)

10. (i) $y - 4 = 3(x + 6)$ M1
 $y = 3x + 22$ A1
- (ii) at B, $x = 0 \therefore y = 2 \Rightarrow B(0, 2)$ B1
at C, $x - 7(3x + 22) + 14 = 0$ M1
 $x = -7$ A1
 $\therefore C(-7, 1)$ A1
- (iii) grad AB = $\frac{2-4}{0-(-6)} = -\frac{1}{3}$ M1 A1
grad AC = $\frac{1-4}{-7-(-6)} = 3$
grad AB \times grad AC = $-\frac{1}{3} \times 3 = -1$ M1
 $\therefore AB$ perp to $AC \therefore \angle BAC = 90^\circ$ A1
- (iv) $AB = \sqrt{(0+6)^2 + (2-4)^2} = \sqrt{36+4} = \sqrt{40} = 2\sqrt{10}$ M1 A1
 $AC = \sqrt{(-7+6)^2 + (1-4)^2} = \sqrt{1+9} = \sqrt{10}$
area = $\frac{1}{2} \times 2\sqrt{10} \times \sqrt{10} = 10$ M1 A1 (14)

Total (72)