

Question Number	Scheme	Marks
6.(a)	Sets $4x+c = x(x-3)$ and attempts to write as a 3TQ	M1
	Uses $b^2 = 4ac$ for their $x^2 - 7x - c = 0$ Correct equation $49 = -4c$ or $49 + 4c = 0$ $c = -12.25$ oe	dM1 A1 A1 (4)
(b)	Attempt to solve $x^2 - 7x - c = 0$ with their c Attempt to find the y coordinate for their x coordinate $\left(\frac{7}{2}, \frac{7}{4}\right)$ oe	M1 dM1 A1 (3) (7 marks)

Question	Scheme	Marks
1	$\int 10x^5 + 6x^3 - \frac{3}{x^2} dx = 10 \times \frac{x^6}{6} + 6 \times \frac{x^4}{4} - 3 \times \frac{x^{-1}}{-1} (+c)$	M1 A1
	$= \frac{5x^6}{3} + \frac{3x^4}{2} + \frac{3}{x} + c$	A1A1
		(4)
		(4 marks)
Notes:		

Question Number	Scheme	Marks
7ai	$f'(4) = \frac{4(4)^2 + 10 - 7(4)^{\frac{1}{2}}}{4(4)^{\frac{1}{2}}} = \frac{15}{2}$	B1
ii	$" \frac{15}{2} " \rightarrow - \frac{2}{15}$ $y + 1 = - \frac{2}{15} (x - 4)$ $2x + 15y + 7 = 0$	M1 M1 A1 (4)
b	$\frac{4x^2 + 10 - 7x^{\frac{1}{2}}}{4x^{\frac{1}{2}}} = \pm \dots x^{\frac{3}{2}} \pm \dots x^{-\frac{1}{2}} \pm \dots$ <p>Two of the terms of $x^{\frac{3}{2}} + \frac{5}{2}x^{-\frac{1}{2}} - \frac{7}{4}$</p> $\int \left(x^{\frac{3}{2}} + \frac{5}{2}x^{-\frac{1}{2}} - \frac{7}{4} \right) dx = \frac{2}{5}x^{\frac{5}{2}} + 5x^{\frac{1}{2}} - \frac{7}{4}x (+c)$ $\frac{2}{5}(4)^{\frac{5}{2}} + 5(4)^{\frac{1}{2}} - \frac{7}{4}(4) + c = -1 \Rightarrow c = \dots$ $(f(x) =) \frac{2}{5}x^{\frac{5}{2}} + 5x^{\frac{1}{2}} - \frac{7}{4}x - \frac{84}{5}$	M1 A1 dM1A1ft ddM1 A1 (6)
		(10 marks)

Question Number	Scheme	Marks
11a	$2(x \pm \dots)^2$	B1
	$\dots(x \pm 3)^2 \dots$	M1
	$2(x-3)^2 - 4$	A1
		(3)
b	$(3, -4)$	B1ft
		(1)
c	$m = \frac{28 - -4}{-1 - 3} (= -8)$	M1
	$y - 28 = -8(x + 1)$	dM1
	$y = -8x + 20$	A1
		(3)
d	$y \leq -8x + 20$ and $y \geq 2x^2 - 12x + 14$ (or $y \geq 2(x-3)^2 - 4$)	B1ftB1ft
	$y \leq -8x + 20$ $y \geq 2x^2 - 12x + 14$ $y \geq 0, x \geq 0$	B1cso
		(3)
		(10 marks)

Question Number	Scheme	Marks
6(a)(i)		B1B1B1
		(3)
(a)(ii)		B1B1
		(2)
(b)	One root because the two graphs intersect each other once	B1
		(1)
		(6 marks)

Question Number	Scheme	Marks
5 (a)	$9x^3 - 10x^2 + x = x(9x^2 - 10x + 1) = x(ax \pm 1)(bx \pm 1) \text{ with } ab = 9$ $= x(9x - 1)(x - 1)$	M1 A1 (2)
(b)	<p>States or implies that $x = 3^y$ AND sets = to their 1 or $\frac{1}{9}$</p> <p>Solves their $3^y = "1"$ or $3^y = "\frac{1}{9}"$</p> <p>$y = 0, -2$</p>	M1 dM1 A1 (3)
		(5 marks)

Question Number	Scheme	Marks
2(a)	$a = 2$ $b = -3$	B1 B1
		(2)
(b)	Any two term of $\int \frac{2x^3 - 3x^2 - 32x - 15}{5\sqrt{x}} dx = \int \frac{2}{5}x^{\frac{5}{2}} - \frac{3}{5}x^{\frac{3}{2}} - \frac{32}{5}x^{\frac{1}{2}} - 3x^{-\frac{1}{2}} dx$ $x^n \rightarrow x^{n+1}$ $\frac{4}{35}x^{\frac{7}{2}} - \frac{6}{25}x^{\frac{5}{2}} - \frac{64}{15}x^{\frac{3}{2}} - 6x^{\frac{1}{2}} + c$	M1A1 M1 A1A1
		(5)
		(7 marks)