Question Number	Scheme	Marks
1.(a)	$\frac{dy}{dx} = \frac{1}{8}\times 3x^2 - 24\times -\frac{1}{2}x^{-\frac{3}{2}}$	M1
	$\frac{dy}{dx} = \frac{3}{8}x^2 + 12x^{-\frac{3}{2}}$	A1 A1 **(3)**
(b)	$\left.\frac{dy}{dx}\right\|_{x=4} = \frac{3}{8}\times 4^2 + 12\times 4^{-\frac{3}{2}} = (7.5)$	M1
	$y+3 = 7.5(x-4) \Rightarrow y = 7.5x - 33$	M1 A1 **(3)** **(6 marks)**

(a)

M1 For reducing a correct power by one on either x term. Allow for either $x^3 \to x^{3-1}$ or $x^{-\frac{1}{2}} \to x^{-\frac{1}{2}-1}$

So this **cannot** be awarded for $\frac{24}{x^{0.5}} \to \frac{24}{0.5x^{-0.5}}$

A1 One term of $\frac{3}{8}x^2 + 12x^{-\frac{3}{2}}$ correct and simplified

A1 $\frac{dy}{dx} = \frac{3}{8}x^2 + 12x^{-\frac{3}{2}}$ or exact simplified equivalent such as $\frac{dy}{dx} = \frac{3}{8}x^2 + \frac{12}{x\sqrt{x}}$.

Isw after a correct answer. There is no need to see the $\frac{dy}{dx}$

(b)

M1 For attempting to find the value of their $\frac{dy}{dx}$ at $x = 4$.

Score for sight of embedded 4's followed by an answer. Condone slips

If no calculations are seen then only award if the value is correct for their $\frac{dy}{dx}$

M1 For correct method of finding the equation of the tangent at $(4, -3)$ using their numerical $\left.\frac{dy}{dx}\right|_{x=4}$

Condone one error on the sign of the 4 and -3 within the tangent formula.

If the form $y = mx + c$ is used they must proceed as far as c = ...

It cannot be awarded from a made- up gradient

A1 $y = 7.5x - 33$ or exact equivalent in the form $y = mx + c$. ISW after a correct answer.

If the form $y = mx + c$ is used they must get correct m and c and write

$y = 7.5x - 33$ oe .....

.....

NB. If a calculator is used to find $\left.\frac{dy}{dx}\right|_{x=4} = 7.5$ **without sight of** $\frac{dy}{dx} = \frac{3}{8}x^2 + 12x^{-\frac{3}{2}}$ then you may allow the final two marks in (b) for correct method to find a correct tangent.