

Q	Marking Instructions	AO	Marks	Typical Solution
12(a)	Rewrites given expression with a fractional power and negative power – at least one index form must be correct	AO1.1a	M1	$y = 6x^{\frac{3}{2}} + 32x^{-1}$ $\frac{dy}{dx} = 6 \times \frac{3}{2} \times x^{\frac{1}{2}} - 32x^{-2}$ $= 9\sqrt{x} - \frac{32}{x^2}$
	Both terms correct	AO1.1b	A1	
	Differentiates 'their' rewritten expression – at least one term correct	AO1.1a	M1	
	Both terms correct for 'their' expression	AO1.1b	A1F	
(b)	Finds the equation of the tangent, a clear attempt must be seen	AO3.1a	M1	When $x = 4$,
	Evaluates 'their' $\frac{dy}{dx}$ (from part (a)) correctly (when $x = 4$)	AO1.1b	A1F	$\frac{dy}{dx} = 9 \times 2 - \frac{32}{16} = 16$ and
	Obtains correct y value (when $x = 4$)	AO1.1b	A1	$y = 6 \times 4 \times 2 + \frac{32}{4} = 56$
	Obtains correct form of the equation of a straight line using 'their' values for y and $\frac{dy}{dx}$	AO1.1b	A1F	Tangent: $y - 56 = 16(x - 4)$ When $y = 0$,
	Deduces value required at x -axis is when y equals 0 (follow through from 'their' equation) Both coordinates needed, any form	AO2.2a	A1F	$x = 4 - \frac{56}{16} = 0.5$ (0.5, 0)
Total			9	