

Question Number	Scheme	Marks
5	$\frac{dy}{dx} = 2e^x(3x^2 - 6) + 12xe^x$ $\frac{d^2y}{dx^2} = [2e^x(3x^2 - 6) + 12xe^x] + [12xe^x + 12e^x]$ $\frac{d^2y}{dx^2} = e^x(6x^2 + 24x)$ $\frac{d^2y}{dx^2} - 2\frac{dy}{dx} + y = 12e^x \quad *$	M1A1A1 M1A1 dM1A1 (7) [7] M1A1A1
ALT	First derivative as above $\frac{dy}{dx} = y + 12xe^x$ $\frac{d^2y}{dx^2} = \frac{dy}{dx} + 12xe^x + 12e^x$ Substitute both derivatives in the given result Correct answer as given, no errors seen	M1A1 dM1 A1
M1 A1 A1 M1 A1 dM1 A1	Differentiate using the product rule. The sum of 2 terms reqd. Either term correct. No simplification needed. Ignore errors made when simplifying. Both terms correct. No simplification needed. Ignore errors made when simplifying. Differentiate again using the product rule <i>correctly</i> on at least one term. (The term the product rule is applied to need not be correct.) Any correct result for $\frac{d^2y}{dx^2}$ (ie their second derivative should be equivalent to the one shown) Complete, probably by substituting their derivatives in LHS of the given result. At least one intermediate step (eg full substitution or bracketed equation above must be seen) Depends on both previous M marks. Fully correct final result reached with no errors seen.	