

June 18
4PM0 Paper 2
Mark Scheme

Question Number	Scheme	Marks
1	$\cos A = \frac{9^2 + 8^2 - 6^2}{2 \times 9 \times 8} \quad \text{or} \quad 6^2 = 9^2 + 8^2 - 2 \times 9 \times 8 \cos A$ $\cos A = \frac{109}{144}$ $A = 40.8^\circ$	M1 A1 A1 [3]
M1 A1 A1	Use the cosine rule, either form. If not for angle BAC there must be a complete method shown for obtaining BAC Correct numerical expression for $\cos BAC$ or for $\sin BAC$ if a longer method used. Need not be simplified. Correct angle as shown 40.80° scores A0 (Ignore any labelling)	
2(a) (b) ALT:	$\frac{dy}{dx} = 3e^{3x} \cos 2x - 2e^{3x} \sin 2x$ $\frac{dy}{dx} = \frac{2e^x(2x^2 - 1) - 2e^x \times 4x}{(2x^2 - 1)^2}$ Use of product rule $y = 2e^x(2x^2 - 1)^{-1}$ $\frac{dy}{dx} = 2e^x(2x^2 - 1)^{-1} - 2e^x(4x)(2x^2 - 1)^{-2}$	M1B1A1 (3) M1A1A1 (3) [6] M1A1A1
(a) M1 B1 A1 (b) M1 A1 A1 ALT: M1 A1 A1	NB: No simplification is required in either (a) or (b). isw any shown Use of product rule. If the rule is quoted it must be correct. 2 terms of form $ke^{3x} \cos 2x$, $k'e^{3x} \sin 2x$ added or subtracted (k , k' integers, inc 1) NB: A mark on e-PEN. Either term in their attempt at the product rule correct Fully correct Use of quotient rule. If the rule is quoted it must be correct. Numerator to be the difference of 2 terms (either way round) of form shown $ke^x(2x^2 - 1)$, $k'xe^x$ Denominator must be correct. One numerator term correct Fully correct numerator Bring up denominator correctly and apply product rule. Difference of 2 terms (either way round) of form shown Either term correct Both terms correct	