

1	Use identity to express integrand in the form $k_1 + k_2 \cos 2x$
	Obtain correct $3 - 3\cos 2x$
	Integrate to obtain $3x - \frac{3}{2}\sin 2x$
2	Attempt solution of quadratic equation in e^{2x} to obtain at least one value of e^{2x}
	Obtain $(e^{2x} - 12)(e^{2x} + 4) = 0$ OE, and hence at least $e^{2x} = 12$
	Obtain $x = \frac{1}{2}\ln 12$ or 1.24 and no other solution
3(a)	Solve $2x - 3 = 5x + 2$ to obtain $-\frac{5}{3}$
	Attempt solution of linear equation where $2x$ and $5x$ have different signs
	Obtain $\frac{1}{7}$
	Alternative Method for Question 3(a)
	State or imply non-modulus equation $(2x - 3)^2 = (5x + 2)^2$
	Attempt complete solution of three-term quadratic equation
	Obtain $-\frac{5}{3}$ and $\frac{1}{7}$ or equivalents
3(b)	State or imply $\cos \theta = -\frac{3}{5}$
	Attempt correct process for finding third quadrant angle
	Obtain 4.07

4	Attempt to express equation in terms of $\tan \theta$ only
	Obtain $\frac{1}{\tan \theta} \times \frac{\tan \theta + \tan 45}{1 - \tan \theta \tan 45} = 7$
	Simplify to obtain equation $7 \tan^2 \theta - 6 \tan \theta + 1 = 0$
	Attempt solution of three-term quadratic equation in $\tan \theta$ to obtain at least one value of θ
	Obtain $\tan \theta = \frac{1}{7}(3 \pm \sqrt{2})$ or equivalent and hence 12.8 and 32.2, and no others in the given range
6(a)	Attempt use of chain rule for differentiation of y or simplification of y and use of the product rule.
	Obtain $\frac{dx}{d\theta} = \sec^2 \theta$ and $\frac{dy}{d\theta} = \cos \theta - 6 \sin^2 \theta \cos \theta$
	Attempt expression for $\frac{dy}{dx}$ in terms of $\cos \theta$ only using <i>their</i> $\frac{dx}{d\theta}$ and $\frac{dy}{d\theta}$
	Obtain $6 \cos^5 \theta - 5 \cos^3 \theta$
6(b)	Attempt solution of $y = 0$ to find value of θ
	Obtain $\sin^2 \theta = \frac{1}{2}$ and hence $\theta = \frac{1}{4}\pi$
	Obtain gradient of curve at the point is $-\frac{1}{\sqrt{2}}$ or exact equivalent
	Attempt equation of normal using negative reciprocal for their gradient
	Obtain $y = \sqrt{2}x - \sqrt{2}$ or exact equivalent

3(a)	Sketch decreasing positive curve for $y = 3e^{-2x}$
	Sketch curve for $y = \sec x$
3(b)	Equate and arrange at least as far as $e^{-2x} = \dots$ or $e^{2x} = \dots$ with $\cos x$ present
	Confirm $x = \frac{1}{2} \ln(3 \cos x)$
3(c)	Use iterative process correctly at least once
	Obtain final answer 0.487
	Show sufficient iterations to justify answer, or show a sign change in the interval $[0.4865, 0.4875]$