

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
5(a)	Attempt solution of $8e^{-\frac{1}{2}x} - 1 = 0$ with use of a relevant logarithm property
	Confirm $x = 6 \ln 2$
	Alternative Method for Question 5(a)
	Substitute $x = 6 \ln 2$ in $8e^{-\frac{1}{2}x} - 1$ and show use of a relevant logarithm property
	Obtain $8e^{-3 \ln 2} - 1$ and hence $8e^{\ln \frac{1}{8}} - 1$ or equivalent and verify answer 0
5(b)	Integrate $8e^{-\frac{1}{2}x} - 1$ to obtain the form $ke^{-\frac{1}{2}x} - x$
	Obtain correct $-16e^{-\frac{1}{2}x} - x$
	Apply limits 0 and $6 \ln 2$ to obtain $-16e^{-\frac{1}{2} \times 6 \ln 2} - 6 \ln 2 + 16$
	Attempt area of triangle minus area under curve
	Obtain $\frac{1}{2} \times 6 \ln 2 \times 7 - (14 - 6 \ln 2)$ or equivalent, and hence $27 \ln 2 - 14$

1	Apply relevant logarithm property
	Obtain correct equation without logarithms $\frac{3x+5}{x-2} = e^4$ or equivalent
	Solve equation to find exact value of x
	Obtain $\frac{2e^4 + 5}{e^4 - 3}$

2(a)	Apply logarithms to both sides and use relevant logarithm property
	Obtain $x < \frac{\ln 0.05}{\ln 4}$ or equivalent and hence $x < -2.16$
2(b)	Attempt solution of equations $3x + 8 = \pm 9$ or of quadratic equation $(3x + 8)^2 = 9^2$
	Obtain values $-\frac{17}{3}$ and $\frac{1}{3}$
	Conclude $-\frac{17}{3} < x < \frac{1}{3}$
2(c)	State $-5, -4, -3$ only

6(a)	Substitute $y = e^{-1}$ in equation and simplify to quadratic equation in x
	Evaluate discriminant
	Obtain $-x^2 + 6x - 11 = 0$, giving discriminant -8 and confirm result
6(b)	Attempt use of product rule for differentiation of $(x^2 - 3)\ln y$
	Obtain $2x \ln y + \frac{x^2 - 3}{y} \frac{dy}{dx}$
	Obtain complete $2x \ln y + \frac{x^2 - 3}{y} \frac{dy}{dx} + 6 = 0$
	Substitute $x = 2$ and $y = e^2$ to find value of gradient of tangent
	Obtain gradient $-14e^2$
	Obtain equation $y = -14e^2x + 29e^2$ or equivalent of required form