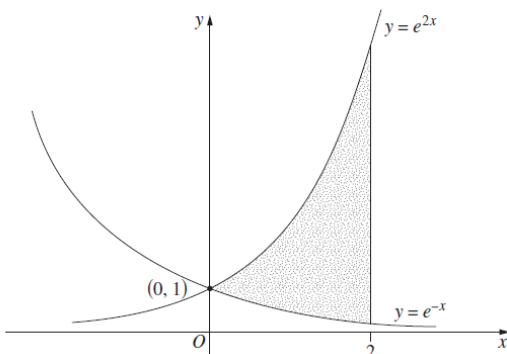


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10	4b	<p>The curves $y = e^{2x}$ and $y = e^{-x}$ intersect at the point $(0, 1)$ as shown in the diagram.</p> <p>Find the exact area enclosed by the curves and the line $x = 2$.</p>		3
		$\begin{aligned} \text{Area} &= \int_0^2 e^{2x} - e^{-x} dx \\ &= \left[\frac{1}{2} e^{2x} + e^{-x} \right]_0^2 \\ &= \left[\frac{1}{2} e^4 + e^{-2} \right] - \left[\frac{1}{2} e^0 + e^0 \right] \\ &= \left[\frac{1}{2} e^4 + e^{-2} \right] - \left[1 \frac{1}{2} \right] \\ &= \frac{1}{2} \left[e^4 + \frac{2}{e^2} - 3 \right] \end{aligned}$	<p>State Mean</p> <p>2.07/3</p>	
		$\therefore \text{ area is } \frac{1}{2} \left[e^4 + \frac{2}{e^2} - 3 \right] \text{ u}^2$		

State Mean:
2.07/3

* These solutions have been provided by [projectmaths](#) and are not supplied or endorsed by the Board of Studies

Board of Studies: Notes from the Marking Centre

The majority of candidates knew to use a definite integral involving the difference of the functions. The better responses needed only three or four steps, using a single integral. Where the negative signs were not dealt with efficiently, those candidates were unable to correctly substitute their limits. Many candidates seemed to be well practised in showing the substitution into the expression before evaluation. Common errors included incorrect limits, incorrect primitives, addition (rather than subtraction) of the functions and subtraction the functions in the wrong order. Many candidates gave a decimal approximation, often incorrect from their initial correct substitutions into the primitive(s).

Source: http://www.boardofstudies.nsw.edu.au/hsc_exams/