05	5c	Find the coordinates of the point P on the curve $y = 2e^x + 3x$ at which the tangent to the curve is parallel to the line $y = 5x - 3$.	3

$y = 5x - 3$. $\therefore$ the gradient is 5

$$y = 2e^x + 3x$$

$$\frac{dy}{dx} = 2e^x + 3. \quad \therefore \text{the gradient function is } 2e^x + 3$$

$$\begin{aligned} 2e^x + 3 &= 5 \\ 2e^x &= 5 - 3 \\ 2e^x &= 2 \\ e^x &= 1 \\ x &= 0 \end{aligned}$$

Subs $x = 0$ in $y = 2e^x + 3x$

$$\begin{aligned} y &= 2e^0 + 3(0) \\ &= 2 \end{aligned}$$

$\therefore P(0, 2)$

* 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

Although most candidates realised that the line in question had a gradient of 5, a significant number of candidates did not then recognise the question as one of calculus. Common errors included equating the function (rather than its derivative) to 5 or to $5x-3$.

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