

Exercise 34

Find an equation of the tangent line to the curve at the given point.

$$y = 2e^x + x, \quad (0, 2)$$

Solution

Since we have a point on the line, we just need to find the line's slope. The aim, then, is to take the derivative of the given function and evaluate it at the given x -coordinate.

$$\begin{aligned} y' &= \frac{d}{dx}(2e^x + x) \\ &= \frac{d}{dx}(2e^x) + \frac{d}{dx}(x) \\ &= 2\frac{d}{dx}(e^x) + \frac{d}{dx}(x) \\ &= 2(e^x) + (1) \\ &= 2e^x + 1 \end{aligned}$$

As planned, evaluate it at $x = 0$.

$$y'(0) = 2 + 1 = 3$$

Therefore, the equation of the tangent line to $y = 2e^x + x$ at $(0, 2)$ is

$$y - 2 = 3(x - 0).$$

