

## Quiz 11 Solutions

Problem 1 Given  $y' = 3e^x + x$ , and  $y(0) = 4$ , find  $y(2)$ .

$$y = \int y' = \int (3e^x + x) dx = 3e^x + \frac{x^2}{2} + C$$

$$y(0) = 3e^{(0)} + \frac{(0)^2}{2} + C = 4$$

$$3 + C = 4 ; C = 1$$

$$y(x) = 3e^x + \frac{x^2}{2} + 1$$

$$y(2) = 3e^2 + \frac{2^2}{2} + 1 = \boxed{3e^2 + 3}$$

Problem 2 Write down the Left Riemann Sum with 200 rectangles used to estimate the area under the curve  $f(x) = 3x^2 + 2$  on the interval  $[1, 1.1]$

$$\Delta x = \frac{1.1 - 1}{200} = \frac{1}{200}, \quad x_i^* = 1 + i \cdot \frac{1}{200}$$

$$L_{200} = \sum_{i=0}^{199} \left( 3 \left( 1 + \frac{i}{200} \right)^2 + 2 \right) \frac{1}{200}$$

$f(x_i^*)$