

9.1 SOLUÇÕES

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$$1. y = 2 + e^{-x^3} \Rightarrow y' = -3x^2 e^{-x^3}.$$

$$\begin{aligned} \text{LHS} &= y' + 3x^2 y \\ &= -3x^2 e^{-x^3} + 3x^2 (2 + e^{-x^3}) \\ &= -3x^2 e^{-x^3} + 6x^2 + 3x^2 e^{-x^3} \\ &= 6x^2 \\ &= \text{RHS} \end{aligned}$$

$$2. y = \frac{2 + \ln x}{x} \Rightarrow$$

$$y' = \frac{x(1/x) - (2 + \ln x)(1)}{(x)^2} = \frac{-1 - \ln x}{x^2} e$$

$$y(1) = \frac{2 + \ln 1}{1} = 2.$$

$$\begin{aligned} \text{LHS} &= x^2 y' + xy \\ &= x^2 \left(\frac{-1 - \ln x}{x^2} \right) + x \left(\frac{2 + \ln x}{x} \right) \\ &= (-1 - \ln x) + (2 + \ln x) \\ &= 1 \\ &= \text{RHS} \end{aligned}$$