**c.** $y' = 1 + y/t, \quad 1 \le t \le 2, \quad y(1) = 2, \quad \text{com } h = 0{,}25$; solução real $y(t) = t \ln t + 2t$.

# Solução Analítica

c) $y' = 1 + \frac{y}{t} \Rightarrow y' - \frac{y}{t} = 1$ ∴ Vamos usar Fator Integrante

$\therefore \mu \cdot y' - \mu \cdot \frac{y}{t} = \mu$ $\quad \therefore \mu = e^{\int P(t)dt} = e^{\int \frac{1}{t}} = e^{\ln|t|} = \frac{1}{t}$

$\frac{1}{t} \cdot \frac{dy}{dt} - \frac{1}{t} \cdot \frac{y}{t} = \frac{1}{t}$ $\quad \therefore$ Produto de derivadas

$(\frac{1}{t} \cdot y) \cdot \frac{d}{dt} = \frac{1}{t}$ $\quad \therefore$ Integramos

$\int (\frac{1}{t} \cdot y) \cdot \frac{d}{dt} dt = \frac{1}{t} dt$

$\frac{1}{t} \cdot y = \ln|t| + C$

$$y = t \cdot \ln|t| + Ct$$

$\therefore y_{(1)} = 2$

$y_{(1)} = 1 \cdot \ln(1) + C \cdot 1$

$C = 2$

$$\therefore y_{(t)} = t \cdot \ln(t) + 2t$$