d. $y' = \cos 2t + \text{sen } 3t,\ 0 \le t \le 1,\quad y(0) = 1,\quad$ com $h = 0{,}25$; solução real $y(t) = \frac{1}{2}\text{ sen } 2t - \frac{1}{3}\cos 3t + \frac{4}{3}$.

Solução Analítica

d) $y' = \cos 2t + \sin 3t$ $\quad\therefore$ Vamos somente integrar

$$\int \frac{dy}{dt}\,dt = \int \cos(2t)\,dt + \int \sin(3t)\,dt$$

I $\int \cos(2t)\,dt \Rightarrow u = 2t \Rightarrow \frac{du}{dt} = 2 \Rightarrow dt = \frac{du}{2} \Rightarrow \frac{1}{2}\int \cos(u)\,du = \frac{1}{2}\cdot \sin(u)$ $\quad u \to 2t$

II $\int \sin(3t)\,dt \Rightarrow v = 3t \Rightarrow \frac{dv}{dt} = 3 \Rightarrow dt = \frac{dv}{3} \Rightarrow \frac{1}{3}\int \sin(v)\,dv = \frac{1}{3}[-\cos(v)]$ $\quad v \to 3t$

$$\therefore \int \frac{dy}{dt}\,dt = \int \cos(2t)\,dt + \int \sin(3t)\,dt$$

$$\boxed{y(t) = \tfrac{1}{2}\sin(2t) - \tfrac{1}{3}\cos(3t) + C}$$

$\therefore y(0) = 1$

$y(0) = \frac{1}{2}\sin(0) - \frac{1}{3}\cos(0) + C$

$1 = \frac{1}{2}\cdot 0 - \frac{1}{3}\cdot 1 + C$

$C = 1 + \frac{1}{3}$

$$\boxed{C = \frac{4}{3}}$$

$$\therefore \boxed{y(t) = \frac{1}{2}\sin(2t) - \frac{1}{3}\cos(3t) + \frac{4}{3}}$$