

$$x = 3 - (3+t)e^{-t}, y = \frac{2-t}{2+t}e^{2t} \quad (t > -2)$$

のとき, $\frac{dy}{dx}$ を t の関数として表せ。

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$$\begin{aligned} \frac{dx}{dt} &= -e^{-t} + (3+t)e^{-t} \\ &= (2+t)e^{-t} \end{aligned}$$

$$\begin{aligned} F(t) &= e^{2t} \\ G(t) &= \frac{2-t}{2+t} \end{aligned}$$

$$\begin{aligned} \frac{dy}{dt} &= \frac{-(2+t) - (2-t)}{(2+t)^2} e^{2t} + \frac{2-t}{2+t} \cdot 2e^{2t} \\ &= \frac{-4 + 2(2-t)(2+t)}{(2+t)^2} e^{2t} \end{aligned}$$

$$= \frac{-4 + 8 - 2t^2}{(2+t)^2} e^{2t}$$

$$= \frac{2(2-t^2)}{(2+t)^2} e^{2t}$$

$$\frac{dy}{dx} = \frac{dy/dt}{dx/dt}$$

$$= \frac{2(2-t^2)}{(2+t)^2} e^{2t} \cdot \frac{1}{(2+t)e^{-t}}$$

$$\frac{dy}{dx} = \frac{2(2-t^2)}{(2+t)^3} e^{3t}$$