Question

Find the general solution of the differential equation $\dfrac{dx}{dt} = e^{(x-t)}$

Answer

$\dfrac{dx}{dt} = e^{(x-t)}$

Separable:

$$\begin{aligned} \frac{dy}{dx} &= e^x e^{-t} \\ \Rightarrow e^{-t}\,dt &= e^{-x}\,dx \\ \int e^{-t}\,dt &= \int e^{-x}\,dx \\ \Rightarrow -e^{-t} &= -e^{-x} + \text{constant} \\ \Rightarrow e^{-t} &= e^{-x} + \text{constant} \end{aligned}$$