

$$\begin{aligned}\frac{dy}{dx} &= \frac{x}{y} \Rightarrow y dy = x dx \Rightarrow \int y dy = \int x dx \Rightarrow \frac{1}{2}y^2 = \frac{1}{2}x^2 + C. \\ y(0) = -2 &\Rightarrow \frac{1}{2}(-2)^2 = \frac{1}{2}(0)^2 + C \Rightarrow C = \frac{4}{2}, \text{ so} \\ \frac{1}{2}y^2 &= \frac{1}{2}x^2 + \frac{4}{2} \Rightarrow y^2 = x^2 + 4 \Rightarrow y = -\sqrt{x^2 + 4} \text{ since} \\ y(0) &= -2 < 0.\end{aligned}$$