11-21

Note Title 11/21/2007

Ex Show that $y = Ce^{x^2/2}$ is a solution of the ODE $y' = xy$.

$$\frac{d}{dx}\left(Ce^{x^2/2}\right) \stackrel{?}{=} x\left(Ce^{x^2/2}\right)$$

$$C\left(e^{x^2/2}\right)\left(\tfrac{1}{2}\cdot 2x\right) \stackrel{?}{=} xCe^{x^2/2} \quad \text{(YES)}$$

Ex Solve the initial-value problem $y' = xy$, $y(0) = 4$.

We know $y = Ce^{x^2/2}$ solves the ODE. Need to satisfy the initial condition, $4 = y(0) = Ce^0 = C$.

$$\boxed{y(x) = 4e^{x^2/2}}$$