

Name : SOLUTION

Solve the following initial value problem.

$$y' = -2xy + 2x \quad y(0) = 1$$

$$y' = 2x(1-y)$$

$$\int \frac{dy}{1-y} = \int 2x dx$$

$$\ln(1-y) = x^2 + c$$

$$1-y = ce^{x^2}$$

$$y(x) = 1 - ce^{x^2}$$

$$y(0) = 1 - c = 1 \Rightarrow c = 0$$

$$\boxed{y(x) = 1}$$

Verification:

$$y' = 0$$

$$-2xy + 2x = -2x \cdot 1 + 2x = 0 \quad \left. \vphantom{-2xy + 2x} \right\} \text{same}$$

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