

DIFFERENTIAL EQUATIONS QUIZ

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Name: Solutions

1. Find the solution of the differential equation that satisfies the given initial condition.

$$y' = -\frac{x}{y}, \quad y(0) = 3.$$

$$y' = -\frac{x}{y} \Rightarrow \int y \, dy = -\int x \, dx$$

$$\Rightarrow \frac{1}{2}y^2 = -\frac{1}{2}x^2 + C$$

$$\Rightarrow y^2 = -x^2 + C$$

$$\Rightarrow 3^2 = -0^2 + C = C$$

$$\Rightarrow y = \sqrt{9 - x^2}$$