

General Solutions and Initial Value Problems

Suppose that I gave you the differential equation

$$\frac{dy}{dt} = 2t.$$

What is the solution?

Example. Verify that $\phi(t) = e^{2t} + C$ is not the general solution to the equation $\frac{dy}{dt} = 2y$, but $y(t) = Ce^{2t}$ works. What is the value of C so that this function satisfies the initial condition $y(0) = 4$