Answer on Question #69660 – Math – Differential Equations

Question

Suppose $y = 2e^{-4x}$ is the solution to the initial value problem

$$y' + ky = 0, \quad y(0) = y_0$$

Find the value of y_0.

Solution

We have that

$$y(0) = 2e^{-4 \cdot 0} = 2$$

Then

$$y_0 = 2.$$

The given function satisfies the equation

$$y' + ky = 0$$

That is

$$(2e^{-4x})' + k(2e^{-4x}) = 0$$
$$-8e^{-4x} + k(2e^{-4x}) = 0$$
$$2k = 8$$
$$k = 4$$

Answer: $y_0 = 2, k = 4$.