

Name: _____
Section: _____

Math 46: Quiz 1

January 22, 2015

Please clearly explain your reasoning and solve the following problems.

1. Find c so that $x(t) = ce^{3t}$ satisfies the initial condition $x(4) = -2$.

We just have to plug in the initial condition here and reduce:

$$\begin{aligned}x(4) &= -2 = Ce^{12} \\ C &= -2e^{-12}\end{aligned}$$

2. Write the differential equation in standard form:

$$(y - x) dx + y^3 dy = 0$$

We need to write the ODE in the form $y' = g(x, y)$.

$$\begin{aligned}y^3 dy &= -(y - x) dx \\ y^3 \frac{dy}{dx} &= x - y \\ \frac{dy}{dx} &= \frac{x - y}{y^3} \\ y' &= \frac{x - y}{y^3}\end{aligned}$$