

This is the corrected quiz

Due September 30, 2010 4:30 PM

MTH 2140 Quiz 2

Instructions: This is a self-scheduled quiz. You can work for as long as you like, but you can't take breaks. You are not allowed to work in groups or discuss problems with other people and you are not allowed to use notes, books, web browsers, calculators, etc. Please place the quiz in my mailbox (in MH250) or in the box outside of my office (MH 257) sometime before Wednesday at 5 PM.

1. Consider the differential equation

$$\frac{d^3}{dt^3}x - \frac{d}{dt}x = e^{\mu t}$$

For what (real) values of μ is there a particular solution $x(t) = Ce^{\mu t}$ for some (real) C ? ¹

2. Solve the initial value problem

$$\begin{cases} \dot{x} = (1-t)x + e^{\frac{-t^2}{2}} \\ x(0) = 1 \end{cases}$$

¹the constant C in the particular solution is often called the *gain*