MA 2051 B2013 — Quiz 2

Name:

Section (circle): 9 a.m. (Nathan) 10 a.m. (Ruofan) 11 a.m. (Alex) noon (Tuan) noon (Hector) 3 p.m. (Jesus)

Instructions: Work neatly. Show your work. Do your work on this paper. Use the back if needed. **Justify your answers.**

1. (4 pts) When a mass of 3 kg is suspended from a spring, the end of the spring moves 0.24 m. Suppose a mass of **2** kg is suspended vertically from that spring and that the **2**-kg mass is set in motion by pulling it down 4 cm and releasing it from rest. Write an initial-value problem whose solution will describe the position of the mass at any time t.

2. (3 pts) Identify a particular physical situation of which the initial-value problem $y''(t) + 2y'(t) + 5y(t) = 0$, $y(0) = 0$, $y'(0) = 0.04$, might be a model. Be sure to specify units.

3. (3 pts) Show that $C_1 \sin\sqrt{k/m}t + C_2 \cos\sqrt{k/m}t$ is a solution of $mx'' + kx = 0$ for any constants C_1, C_2. (**Hint:** *show* means *check*.) Use the back of this page if necessary.