

## Math 1B: Quiz 6

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You must always justify your answers. This means: show your work, show it neatly, and when in doubt, use words (and pictures!) to explain your reasoning. No justification = no points.

1. (10 pts) A bob of mass  $m = 1$  kg is on the end of a spring with spring constant  $k = 3$  kg/s<sup>2</sup>, and placed in a viscous fluid providing a frictive damping constant  $c = 4$  kg/s. The spring is driven by a force  $F(t) = \sin(t/\text{s})$  kg m/s<sup>2</sup>, where  $t$  is the time. When  $t = 0$ , the spring is at rest in its neutral position. Find a formula describing the position of the spring as a function of time.