**MATH 246 Groupwork 2.8** **Name:** _____

1. A mass of 2kg stretches a spring 4.9m. It is then stretched an additional 0.3m and released with a downward velocity of 0.05m/s. The system is submerged in a fluid which imparts a damping coefficient of $\gamma = 0.5$Ns/m. No external force is applied.

   (a) Find the spring constant. Note: $mg = ky_R$. You know $m$, $y_R < 0$, and $g < 0$. Find $k$.

   (b) Write down the initial value problem representing this situation.

   (c) Solve. On the back of this sheet draw a believable graph.

   (d) What would $\gamma$ need to be in order to critically damp the system?

(e) Believable graph: