# MATH 211: 9-18 WORKSHEET

(1) The density of a length of wire is given by the function $\rho(x) = 2 + e^{-x}$, where $0 \leq x \leq 3$ and $\rho(x)$ is measured in grams per centimeter. Determine the mass of the wire, its moment, and its center of mass.

(2) You are out mushroom hunting on the Simon's Rock campus. Your field guide tells you that the diameters for the caps of a certain species of mushrooms are described by the probability distribution function

$$\rho(x) = -\frac{x^2}{72} + \frac{x}{6} - \frac{5}{18}, \qquad 4 \leq x \leq 10,$$

where $\rho(x)$ is measured in centimeters. Check that $\rho(x)$ is indeed a probability distribution function (i.e. that its total integral $= 1$). What is the mean diameter of a randomly collected mushroom? What is the probability that a randomly collected mushroom has a diameter larger than the mean?