HOMEWORK 2, STAT 251

(1) For this question, we are working with the following probability mass function (pmf).

$$f(x) = \frac{7!}{x!(7-x)!}(.6)^x(.4)^{(7-x)}\mathbb{1}_{(x\in\{0,1,2,3,4,5,6,7\})}$$

   (a) Plot the pmf using R, and make sure to include the graphic and your R code in your answer. The axis labels and overall chart title should be descriptive–make the plot look nice and be self-explanatory.
   (b) What is the mean of X's distribution?
   (c) What is the support of X's distribution?

(2) For this question, we are working with the following probability density function (pdf).

$$f(x) = (1/100)\exp(x/100)\mathbb{1}_{(x<0)}$$

   (a) Plot the pdf using R, and make sure to include the graphic and your R code in your answer. Also, make sure that you do NOT call the y-axis the probability, but rather the probability density (or density, for short).
   (b) What is the support of X's distribution?

(3) Identify the following by using the appropriate R code. In each part below, the assumption is that Y has the Normal distribution with mean 20 and variance=4^2=16. In the future, I would abbreviate this by saying $Y \sim N(20, 4^2)$.
   (a) What is the standard deviation of Y? (No R code necessary for this part)
   (b) $P(Y < 28.4)$.
   (c) $P(Y > 14)$.
   (d) $P(17.4 < Y \leq 23.9)$.
   (e) The first quartile (i.e., 25th percentile) of Y's distribution.
   (f) The probability density at the distribution's mode (i.e., what is f(20), because's the distribution's peak is at the value $y = 20$).