Name:

Math 10a
November 20, 2014
Quiz #9

1. (a) (1 point) Flip three fair coins. What is the probability that you get exactly two heads?

   (b) (2 points) Let X denote the number of heads in three flips of a fair coin. Write down the pmf for X.

   (c) (2 points) X as in part (b). What are $E(X)$ and $\mathrm{Var}(X)$?

2. (1 point) Suppose the pmf for a random varible X is given by

$$f(k) = \begin{cases} \frac{2}{3}\left(\frac{1}{3}\right)^k & k = 0, 1, 2, 3, \cdots \\ 0 & \text{otherwise} \end{cases}.$$

Write down a series that computes $E(X)$.

3. (1 point) Let X denote the number of times lightning strikes the Empire State Building in a year. Suppose X follows a Poisson distribution with $\lambda = 25$. What is the probability that lightning strikes the building at least twice during the year?

4. Consider a random variable X whose pdf is

$$f(x) = \begin{cases} \frac{1}{2}\sin(x) & x \in [0, \pi] \\ 0 & \text{otherwise} \end{cases}.$$

(a) (1 point) What is $P(X \geq \frac{\pi}{6})$?

(b) (2 points) What is $E(X)$?