Stat261 - Spring 2018
Assignment #1 - due Thursday, January 11 in class
Neatly hand write your solutions - marks will be assigned for presentation

1. Let X be a random variable with mean $\mu = 4$ and variance $\sigma^2 = 8$. What is $E(2X^2)$?

2. In November of each year, a walk-in clinic allows people to walk in to get a flu shot. Let X be the number of people who come to the clinic for a flu shot on a randomly selected day (in November). Suppose X has the following distribution:

x	0	1	2	3	4	5
$P(X = x)$	0.3	0.2	0.2	0.1	0.1	0.1

   If at least 2 people walk in for a flu shot on a particular day, what is the probability that there are 4 or fewer who walk in for a flu shot that day?

3. You want to read a disk sector from a 7200rpm disk drive. Let T be the time you wait, in milliseconds, after the disk head is positioned over the correct track, until the desired sector rotates under the head. The random variable T has the following probability density function (pdf),

$$f(x) = \begin{cases} c(x^2 - 1) & 1 \le x < 3 \\ 0 & \text{otherwise} \end{cases}$$

   (a) Compute the value of c in the pdf.

   (b) Compute the probability X is between 1.5 and 2.25 inclusive.

4. Assume a page in the book will be considered **defective** if there are more than 3 typos on the page. On average, on one page there is 1 typo. Let X denote the number of typos on one page and assume that it has a Poisson distribution. What is the probability that a randomly chosen page is defective?

5. The thickness measurements of glass sheets produced by a certain process are normally distributed with a mean of $\mu = 3.00$ mm and a standard deviation of $\sigma = 0.12$ mm. What is the value of c for which there is a 99% probability that a glass sheet has a thickness measurement within the interval (3.00-c, 3.00+c)?

6. Daily sales at a gas station are thought to be independent of one another with daily mean $5250 and standard deviation $700. Approximate the probability that the average daily sales over one year (i.e. 365 days) is greater than $6,000.