Fourth Homework for 101 stat

1- Let X be a discrete random variable representing the sum of the two numbers on throwing two **identical** balanced dice for one time only. Then:

    a. Find the possible values of the random variable X for the following cases:

    b. Determine is the probability mass function $P\left(X = \bullet\right)$.

    c. Determine the distribution function F_X.

    d. Calculate the mean and variance for the random variable X.

2- Consider rolling a balanced die twice and let the random variable X be the maximum of the two numbers obtained. Then:

    a. Determine the probability mass function and distribution function of X.

    b. Sketch the functions in part (a).

3- Let X be a discrete random variable with probability mass function: $\quad P\left(X = k\right) = c\dfrac{k}{7} \quad ; k = 2, 3, 4, 5$

Then:

    a. Determine the value of the constant c that make f probability density function.

    b. Determine the distribution function of X.

    c. Calculate the mean and variance of random variables X and $3X - 5$. What do you notice?

4- We consider a discreet random variable X with the following probability mass function (**p.m.f.**):

x	-2	-1	0	1	2
$P_x = P\left(X = x\right)$	0.20	0.15	0.15	0.1	0.4

    a. Determine the distribution function (**D.f.**) F_X, and draw the **p.m.f.** and **D.f.** for this variable.

5- Let X be a random variable with the following density function (this random variable is called **discrete uniform distributed**):

$$P\left(X = x\right) = 0.2 \quad \text{for } x = 5,\ 6,\ 7,\ 8,\ 9.$$

    a. Determine the distribution of the variable X.

    b. Draw the graph of the density and distribution function for this variable.

6- Let the time for a student to finish the aptitude test of NCAHE (in hours) is a continuous random variable X with:
$$f_X(x) = \begin{cases} 6\left(x - 1\right)\left(2 - x\right) & for\ 1 \le x < 2 \\ 0 & otherwise \end{cases}$$

Then:

    a. Determine the distribution function F_X.

    b. Calculate the mean and variance for X.

    c. What is the probability that a student can finish the test in 90 minutes?