FINITE MATH, FALL 2016 - PROBLEM SET 8

Name: _____

Use this worksheet as the cover sheet for your write-up: write your name on this page, and staple this sheet to the front of your homework packet.

You will receive no credit for submitting solutions that the grader cannot read and understand—be sure to write legibly!

Problem 1. For each experiment described below, let x determine a random variable, use your knowledge of probability to prepare a probability distribution table:

(1) Four coins are tossed and the number of heads is noted.
(2) Two dice are rolled and the total number of points is recorded.

Problem 2. Given the following situation, find the expected value of:

(1) In a club with 20 senior members and 10 junior members, what is the expected value of a junior member being on a 3-member committee?
(2) From a group of 2 women and 5 men, a delegation of 2 is selected. Find the expected value of the number of women in the delegation.

Problem 3. Find the range and standard deviation for each of the following set of numbers:

(1) 42,38,29,74,82,71,35.
(2) 51,58,62,64,67,71,74,78,82,93.
(3) 15,42,53,7,9,12,28,41,63,14.

Problem 4. From class, we had two equations that we could use to calculate variance:

$$s^2 = \frac{\sum_{i=1}^{n} x_i^2 - n\bar{x}^2}{n-1} \tag{1}$$

and

$$s^2 = \frac{\sum_{i=1}^{n} (x_i - \bar{x})^2}{n-1} \tag{2}$$

Prove that (1) and (2) are the same.

Problem 5. The amount of time that it takes for various slow growing tumours to double its size are listed in the following table:

Date: November 4th, 2016.

Type of Cancer	Doubling time (days)
Breast Canter	84
Rectal Cancer	91
Synovioma	128
Skin Cancer	131
Lip Cancer	143
Testicular Cancer	153
Esophagus Cancer	164

(1) Find the mean and standard deviation of the data given above.
(2) If a person had a nonspecific cancer with doubling time of 200 days, discuss whether this particular tumor is growing at a rate that would be expected.