

Homework for Math 211, Summer 2010

A. Ch. 2 / 3, 4, 7, 9, 11, 15, 17, 23, 25, 29. (No bonus problems for this assignment.)

B. Ch. 3 / 5, 7, 9, 11, 13, 15, 19, 23, 24, 25, 27 (no graph required), 35, 37, 39. Also:

1. A survey was conducted to evaluate the effectiveness of a new flu vaccine that had been administered in a small community. The vaccine was provided free of charge in a two-shot sequence over a period of 2 weeks. Some people received the two-shot sequence, some appeared for only the first shot, and others received neither. Some people reported contracting the flu, and others did not. A survey of 1000 local residents the following spring provided the information shown in the table below.

	No Vaccine	One Shot	Two Shots	Total
Flu	24	9	13	46
No Flu	289	100	565	954
Total	313	109	578	1000

- What percent of people who received both shots contracted the flu?
- What percent of people who received no vaccine contracted the flu?
- What percent of people who contracted the flu received no vaccine?
- Do you think that the amount of vaccine received, and whether someone contracted the flu, are independent for the people in this sample? Explain.

2. A news organization polled close to a thousand Americans a day after the September 11, 2001 terrorist attacks. The following question was asked: "Which one of the following emotions do you feel the most strongly in response to these terrorist attacks: sadness, fear, anger, disbelief, vulnerability?" The results are presented in the table below:

Gender	Emotion					
	Sadness	Fear	Anger	Disbelief	Vulnerability	Not Sure
Female	188	42	174	160	56	8
Male	56	16	141	50	36	5

- How many subjects responded?

b. More women than men reported feeling anger most strongly in this sample. Do you think this suggests that among all Americans, more women than men felt anger most strongly? Explain.

c. Do you think the variables *gender* and *emotion* are independent, dependent, or neither? Explain.

C. Chapter 4: 5, 7, 8, 11, 12, 13, 21, 23, 25, 29 (show your work; give the standard deviations as simplified radical expressions), 31, 32 (making the histogram on your calculator is good enough; you do not have to reproduce it in your homework), 37, 46. Also:

1. A sample of 65 men and 65 women is taken; for each subject, a resting heart pulse rate (in beats per minute) is recorded. The data is recorded below. You will need to enter this data into your calculator (be patient.) **DO NOT ERASE THIS** if you can help it – you will need it again in assignment **D**.

Women:	69	62	75	66	68	57	61	84	61	77	62	71
	68	69	79	76	87	78	73	89	81	73	64	65
	73	69	57	79	78	80	79	81	73	74	84	83
	82	85	86	77	72	79	59	64	65	82	64	70
	83	89	69	73	84	76	79	81	80	74	77	66
	68	77	79	78	77							
Men:	70	71	74	80	73	75	82	64	69	70	68	72
	78	70	75	74	69	73	77	56	73	65	74	76
	72	78	71	74	67	64	78	73	67	66	64	71
	72	86	72	68	70	82	84	68	71	77	78	83
	66	70	82	73	78	78	81	78	80	75	79	81
	71	83	63	70	75							

a. Report the mean pulse rate for each gender, rounded to two places after the decimal point. Which gender has the highest mean pulse rate?

b. What is the mean pulse rate for all 130 people in the sample? (round to two places after the decimal point)

c. Find the median pulse rate for males and for females. Which gender has the higher median pulse rate? Does this agree with your findings for the mean earlier?

d. Suppose the fastest male pulse rate was a typo, so we just remove it altogether from the list. How would removing that one data point affect the mean men's pulse rate and the median men's pulse rate?

e. Find the mean female pulse rate measured in beats *per hour*. (Hint: you do not need to recalculate each of the 65 entries.)

2. A table of the top-selling soft-drink brands is provided below:

Brand	Millions of Cases Sold
Coke Classic	1929
Pepsi-Cola	1385
Diet Coke	811
Sprite	541
Dr. Pepper	537
Mountain Dew	536
Diet Pepsi	530
7-Up	220
Caffeine-Free Diet Coke	180
Caffeine-Free Diet Pepsi	97

a. Find the mean and median number of cases sold for these ten brands.

b. Find the range, IQR, and (sample) standard deviation for the number of cases sold.

3. Create your own data set with ten entries, for which the mean is greater than the median and the median is greater than the mode.

D. Chapter 5: 5, 9, 11, 13, 15, 19, 21, 23, 25, 29, 30, 31, 33, 37. Also:

1. Draw parallel boxplots of the pulse rate data from assignment **C** to turn in. Make them pretty. Do you notice any data points that should be treated as outliers according to the 1.5-IQR guidelines?

E. Chapter 6: 1-23 odd, 31, 33, 37-47 odd, 49, 53, 57. (Important chapter = lots of questions)
Also:

1. The starting players on a women's volleyball team have a mean height of 70 inches, with a (sample) standard deviation of 25 inches.

a. What is the (sample) variance of their heights? What units is the variance measured in?

b. What would be the mean height of the team, measured in *feet*? What would be the standard deviation, in feet?

c. Suppose we remeasure the heights of the players, but this time we make each player stand on a ten-inch stool and add those ten inches to their recorded height. What is the new mean, and what is the new standard deviation?

2. Suppose that the birth weights of babies in a special treatment group are Normally distributed with a population mean $\mu = 3285$ grams and a population standard deviation of $\sigma = 500$ grams.

a. Sketch a Normal curve for this distribution.

b. Find the percentage of babies in this group that have a birth weight greater than or equal to 4000 g. Round to the nearest hundredth of a percent.

c. Find the percentage of babies in this group that have a birth weight more than 750 grams above or below the mean. Round to the nearest hundredth of a percent.

d. According to the Normal model, 75% of all babies will have a birth weight less than or equal to what? Round to the nearest hundredth of a gram.

e. According to the Normal model, the heaviest 1% of all babies will have a birth weight greater than or equal to what? Round to the nearest hundredth of a gram.

f. Find the percentage of babies in this group that have a birth weight between 3000 and 4000 grams. Round to the nearest hundredth of a percent.

3. At the local OK Cola bottling plant, a clumsy worker accidentally bumps a lever and changes a setting so that all the 1-liter bottles of cola are not completely filled. Analysis of the resulting bottles shows that the new fill levels are Normally distributed with a (population) standard deviation of 0.04 liters. If only 7% of all bottles contain 0.89 L or more of cola, find the *mean* of the population.