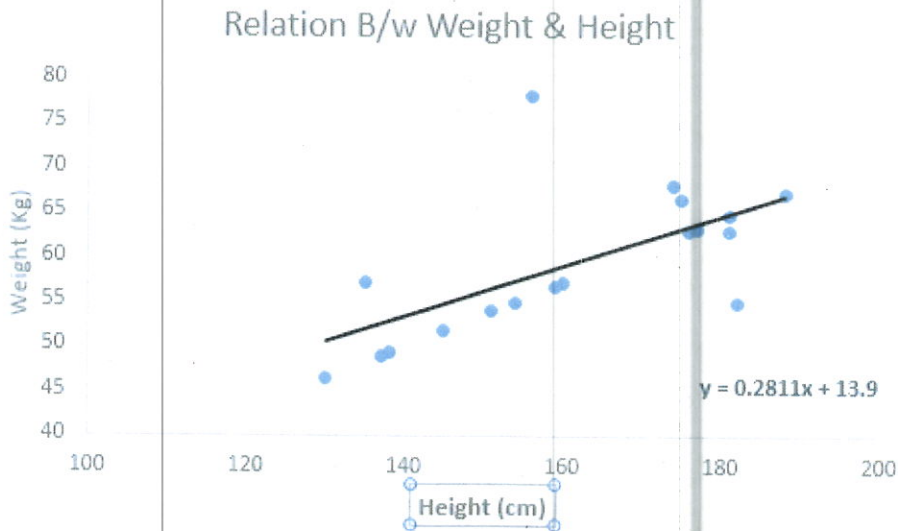


Instructions: Answer each question as thoroughly as possible. You may round your answers to an appropriate number of decimal places, however, you may leave fractions as fractions. To show work on calculator questions, you may write the keystrokes or commands used in your calculator. Problems that show no work will be graded as all or nothing; problems that show work may earn partial credit.

1. The graph below shows a scatterplot with the linear regression line and coefficient of determination shown. Use this information to answer the questions that follow.



- a. Is the sign of the correlation coefficient positive or negative? (3 points)

positive

- b. Use the regression equation to predict the average weight of a person who is 175 cm tall. (This is roughly equivalent to someone 5'9".) (5 points)

$$y = 0.2811(175) + 13.9 = 63.09 \text{ kg}$$

- c. What is the prediction for the average weight of someone who is only 100 cm tall? Is this extrapolation reasonable based on the data graphed? Explain. (6 points)

$$y = 0.2811(100) + 13.9 = 42.01 \text{ kg}$$

it's shown on the graph & is positive, but we should be cautious since it's outside the range of the original data

- d. Interpret the slope in the context of the problem using appropriate units. (5 points)

for each cm taller, a person can expect to gain .28 kg of mass.

2. If two cards are drawn (without replacement) from a standard deck of 52 well-shuffled cards, what is the probability that both cards are kings? (4 points)

$$\frac{4}{52} \cdot \frac{3}{51} = \frac{1}{221} \approx .0045$$

3. Which of the following statements do you think could possibly be true? (3 points)
- The number of students enrolled at AACC decreased by 110% from last year.
 - A student flips a coin 10 times and observes 65% of the time the coin lands on tails.
 - The probability that the Cleveland Browns win the Super Bowl this year is 100%.
 - 35% of AACC students are enrolled full-time.
4. Here is the distribution of ethnicity for inmates on death row as of April 2013.

Ethnicity	African American	Caucasian	Latino	Native American	Asian
Probability	0.42	0.43	0.13	0.01	0.01

- a. What is the probability that a death row inmate is a not an African American? (2 points)

$$1 - .42 = .58$$

- b. What is the probability that a death-row inmate is Latino or Native American? (3 points)

$$.13 + .01 = .14$$

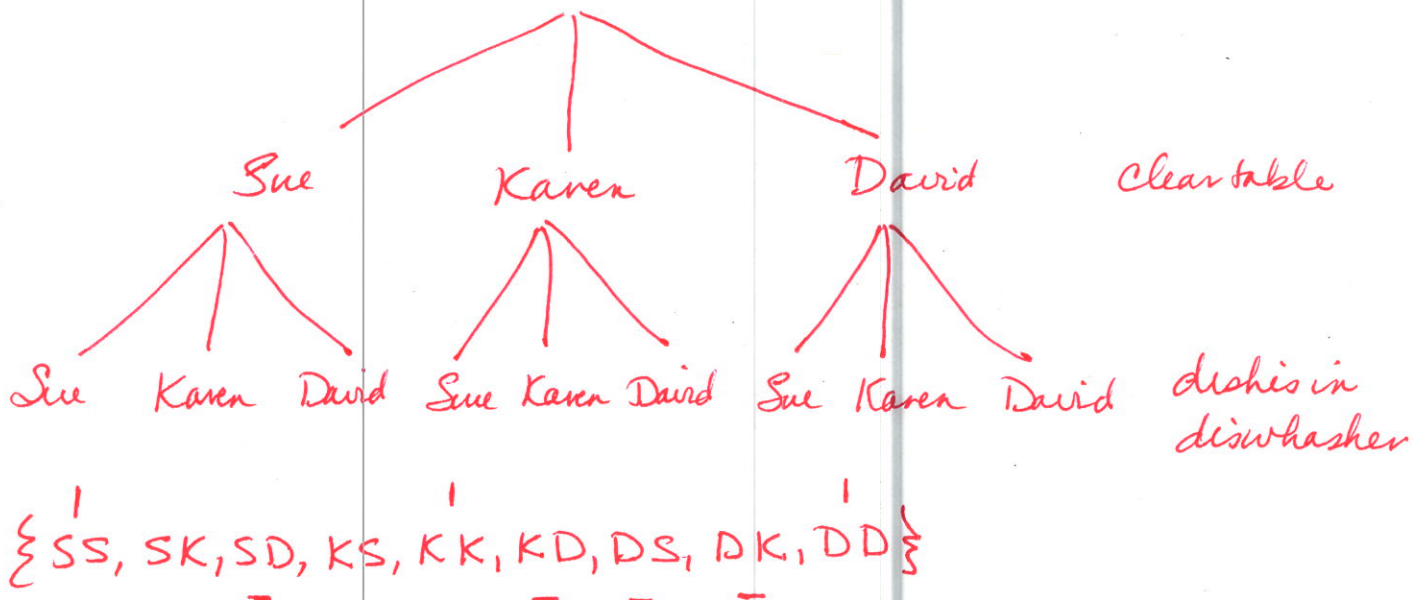
5. The numbers 5 through 16 are written on index cards (see the list below). If one card is drawn at random, what is the **probability** that it is an **odd** number OR a **two digit** number? (4 points)

List of numbers on cards:

5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16

$$\frac{10}{12} = \frac{5}{6}$$

6. Mrs. Duda has three children: two girls (Sue and Karen) and one boy (David). After dinner, one child is chosen at random to clear the table and one child is chosen at random to put the dishes in the dishwasher.
- a. If the same child can be chosen for both chores, list a sample space of all the possible outcomes of who will clear the table and put the dishes in the dishwasher after dinner. [Hint: Use a tree diagram.] (8 points)



- b. What is the probability that one boy and one girl will complete the chores after dinner? (4 points)

$$\frac{4}{9}$$

- c. What is the probability of having the same child complete the chores after dinner? (4 points)

$$\frac{3}{9}$$

7. Use the table below to answer the following questions.

a. Complete the table of the undergraduate enrollment at a large state university: (10 points)

<u>Class</u>	<u>Students</u>	<u>Relative Frequency</u> (Percent rounded to the nearest tenth)
Freshmen	8248	26.8%
Sophomore	8073	26.2%
Junior	7001	22.8%
Senior	6904	22.4%
Non-degree	535	1.7%
Total	30761	100%

b. This table displays a categorical quantitative variable. (circle one) (2 points)

c. The two graphs that would be appropriate to display the percentages above are: (circle) (3 points)

i. Bar graph and histogram

ii. Pie chart and boxplot

iii. Bar graph and pie chart

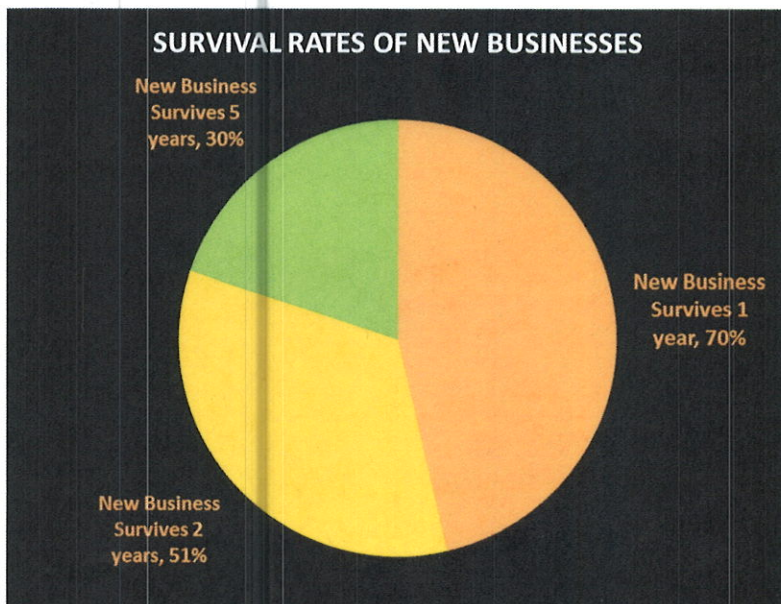
iv. Histogram and pie chart

v. Boxplot and stem-and-leaf plot

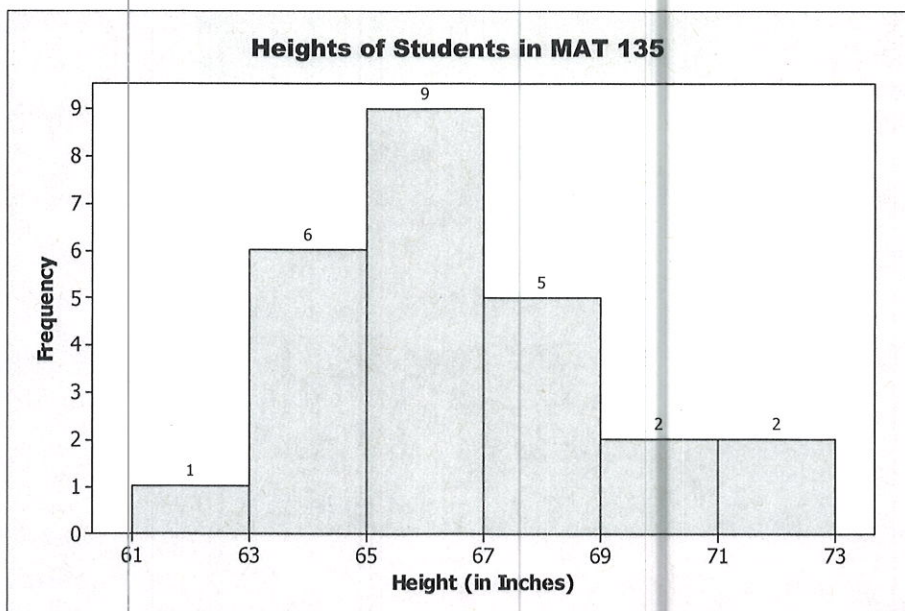
vi. Line graph and stem-and-leaf plot

8. Explain why the pie chart on the right is a poor choice of graph for the data being displayed. Sketch a better graph for this data. (8 points)

*The %'s don't add up to 100
 - if a business survives for 5 years
 it is already included in the 3-year
 & 1-year survivals*



9. The figure below is a histogram of the heights, in inches, of a section of MAT 135 students last summer semester.



- a. What percent of students in this section were taller than 67 inches? (4 points)

$$\frac{5+2+2}{1+6+9+5+2+2} = \frac{9}{25} = 36\%$$

65 or 66

- b. Rachel is the student with the median height of this section. In what range could her height be? (4 points)
10. The following graph shows the heart rate of students in a conditioning class after 1 minute of doing jumping jacks (beats per minute).

Stem	Leaf
6	8
7	
7	
8	
8	
9	2 4
9	6
10	0
10	5 6 6
11	0 0 2 2
11	5 8 8
12	0 0
12	5 5 6

Stem	Leaf
6	8
7	
8	
9	2 4 6
10	0 5 6 6
11	0 0 2 2 5 8 8
12	0 0 5 5 6

Key: 9|2 = 92 beats per minute

- a. Which stem-and-leaf plot is more appropriate for the data? Explain. (4 points)
- The one on the right is better. The one on the left is too spread out (looks squished)*
- b. The overall shape of this distribution is left skewed (2 points)
- c. For this data, the mean will be lower than the median. (2 points)
- d. Do any of the heart rates appear to be an outlier? Explain. (4 points) *yes, 68 is much lower than all the others*
11. Given the following data set: 7, 6, 8, 10, 4, 4, 3, 2, 14, 3, 8, 4, 5

a. Find the mean (3 points) $\bar{x} = 6$

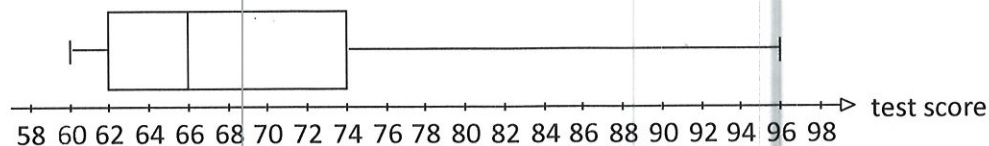
b. Find the median (3 points) $Med = 5$

c. Give the mode (3 points) *Mode = 4*

12. The standard deviation is a measure of the (2 points)

- a. center of a distribution
- b. validity of measurement
- c. height of a histogram
- d. spread, or variability of a distribution
- e. most common value in a set of data

13. From the boxplot for test scores on a Math exam find

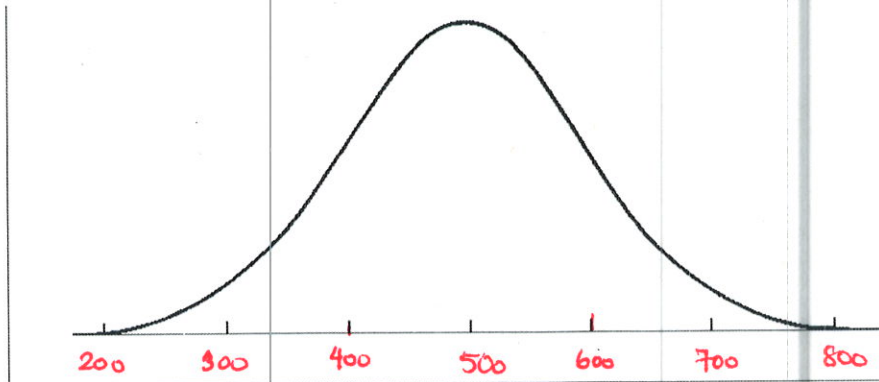


- a. The lowest score (2 points) *60*
- b. Quartile 3 (2 points) *74*
- c. The median (2 points) *66*
- d. What percentage of the students earned **above** 62 points? (3 points) *75%*
- e. Between which two point values did the middle 50% of the students score?
Between *62* and *74* points. (4 points)
- f. Does the boxplot above represent a roughly symmetric, a left skewed, or a right skewed distribution? (3 points) *right skewed*
- g. What is the range of the data? (3 points)

$$96 - 60 = 36$$

Bonus:

14. The SAT Critical Reading score has a mean of 500 and a standard deviation of 100. Sketch the distribution on the graph below and use it to answer the questions that follow. (5 points)



a. What percent of the SAT Critical Reading scores fall between 400 and 600? (3 points)

68%



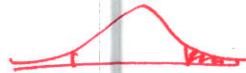
b. What percent of the SAT Critical Reading scores fall between 500 and 700? (3 points)

$$\frac{95}{2} = 47.5\%$$



c. What percent of the SAT Critical Reading scores fall above 700? (3 points)

2.5%



d. What percent of the SAT Critical Reading scores call below 400? (3 points)

16%



15. List the data displayed in the stem-and-leaf plot to the right.

4, 6, 12, 14, 18, 33, 34, 34, 35, 35, 37, 38, 42, 42, 45, 50,
51, 58, 68, 72

a. What is the percentile of the value 14? (3 points)

$$\frac{4}{20} = 20^{\text{th}}$$

b. What is the percentile of the value 50? (3 points)

$$\frac{16}{20} = 80^{\text{th}}$$

Stemplot of Data Set

0	4 6
1	2 4 8
2	
3	3 4 4 5 5 7 8
4	2 2 5
5	0 1 8
6	8
7	2

Key: 1|0 = 10