

Part 1: Answer 2 of the following 3 questions in this part. Each problem you complete is worth 20 points.

1) Construct a frequency distribution (*in ascending order*), relative frequency distribution, cumulative frequency distribution, and a histogram for each with 6 intervals from the following data set:

Amount of gasoline purchased by 28 drivers:

7	4	18	4	9	8	8
7	6	2	9	5	9	12
4	14	15	7	10	2	3
11	4	4	9	12	5	3

2) **Temperature vs. Cricket Chirps:** Crickets make a chirping noise by sliding their wings over each other. Perhaps you have noticed that the number of chirps seems to increase with the temperature. The following data list the temperature (Fahrenheit) and the number of chips per second for the striped ground cricket.

Temp (F)	69.4	69.7	71.6	75.2	76.3	79.6	80.6	82	82.6
Chirps/Sec	15.4	14.7	16	15.5	14.4	15	17.1	16	17.1

- Use your graphing calculator to create a scatter plot of the data. Make a graph of the scatter plot in the accompanying viewing window.
- Use the regression feature of your graphing calculator to find a linear, quadratic, and an exponential model of the data. Graph each with the scatter plot, and round to three decimal places.
- Identify the best-fit model for the data.
- Using the best-fit model, find the outside temperature (to the nearest tenth of a degree) if a cricket makes 13 chirps a second.
- Using the best-fit model, find the number of chirps per second if the outside temperature is 90.1 degrees.

3) In the table below, the average monthly temperatures for Pullman and Seattle are shown.

Month	Pullman	Seattle
January	34.5	14.7
February	40.5	40.1
March	47.0	53.4
April	55.9	59.4
May	64.4	66.7
June	71.2	71.2
July	81.6	76.9
August	81.9	76.3
September	72.8	71.0
October	59.8	61.3
November	43.7	52.0
December	35.9	47.1

- Perform the five number summary for each city.
- Draw a box & whisker graph for each city from the data.
- Find the interquartile range, the lower and the upper fence values for Seattle's average monthly temperatures.
- Identify any outliers for the data.
- Construct a modified box plot for Seattle's average monthly temperature.
- Find the percent increase from February to March for Pullman's average monthly temperature to the nearest tenth of a percent.

Part 2: Answer 4 of the following 6 questions in this part. Each problem you complete is worth 15 points.

4) The following are data on weekend exercise time for 20 females consistent with summary quantities in the paper, "An Ecological Momentary Assessment of the Physical Activity and Sedentary Behavior Patterns of University Students" (*Health Education Journal* [2010])

Weekend Exercise (minutes):

84.0 27.0 82.5 0.0 5.0 13.0 44.5 3.0 0.0 14.5
 45.5 39.5 6.5 34.5 0.0 14.5 40.5 44.5 54.0 0.0

- Calculate the mean, median, and standard deviation for the data.
- Find the percent of the data that lies outside of 1 standard deviation of the mean.
- Find the 5 % and the 10 % trimmed mean for the data.

5) Given the previous statistics exam grades for 20 statistics students,

97, 92, 88, 75, 83, 67, 89, 55, 72, 78, 81, 91, 57, 63, 67, 74, 87, 84, 98, 46

- Create a stem and leaf plot for the data.
- Find the nearest score that falls at the 86th percentile for the data.
- Find the nearest score that falls at the 3rd decile.
- Find the percentile rank for a score of 67.

6) Answer a), b), and c):

- The final grade in a course is calculated according to the following scale: Quizzes count for 15%, 3 exams whose average counts 60%, and the final exam is worth 25%. Calculate the final score for a student who has scored 95 on quizzes, has exam scores of 83, 94, and 77, and a final exam score of 88.
- A college awards 4 points for an A, 3 points for a B, 2 points for a C, and 1 point for a D. Calculate the Grade Point Average (GPA) for a college student who earned an A in a four-credit course, a B in two two-credit courses, and a D in a four-credit course.
- Trade winds are one of the beautiful features of island life in Hawaii. The following data represent total air movement in miles each day over a weather station in Hawaii as determined by a continuous anemometer recorder. The period of observation was January 1 to February 16. Calculate the Mean Absolute Deviation for the Data rounding to the nearest tenth.

26	14	18	14	113	50	13	22
27	57	28	50	72	105	138	16

7) The stem-and-leaf plot below is used to display the number of vehicles sold by the Ford and Nissan dealerships in a town each week for a three month period.

Ford	Nissan
7 4 0	3 8 8 9 9
9 5 2 2 1 0 1	1 1 6 6
8 5 4 4 2	2 7 9
0 3	5

Key: 30 = 0 | 3 | 5 = 35

- Calculate the median of both distributions.
- Calculate the range of both distributions.
- Calculate the interquartile range of both distributions.
- Describe the skewness of the data for the Nissan dealership.

8) The total credit card volume for Visa, MasterCard, American Express, and Discover has increased dramatically in recent years, as shown in the table below. (Source, CardWeb Inc.'s CardData)

Year, x	Credit Card Volume, y (In Billions)
1998	261.0
1999	296.3
2000	338.4
2001	361.0
2002	403.1
2003	476.7
2004	584.8
2005	701.2
2006	798.3
2007	885.2

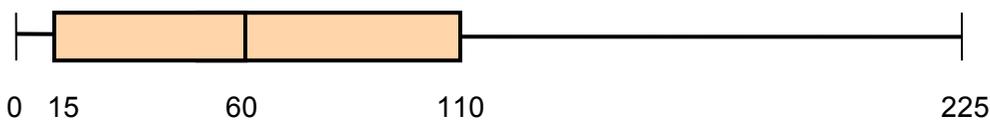
- Draw a scatter plot of the data by letting 0 correspond to the year 2000.
- Calculate a cubic regression for the data.
- Graph the curve on the scatter plot.
- Use the regression model to predict the credit card volume in 2013 and in 2020.

9) Refer to the box & whisker graphs below that compare homework time per night with other screen time per night for the same group of 28 sophomores.

TV & Homework Minutes per Night



Homework Time



Other Screen Time

Answer the following questions: (2 points each)

- What percent of the sophomores do HW for at least 20 minutes per night?
- What is the upper quartile for the TV time data?
- What percent of sophomores spent less than 15 minutes on Other Screen Time?
- How many sophomores spent at most 1 hour doing their homework per night?
- How many sophomores spent more than 1 hour 50 minutes on Other Screen Time?

For questions f-j, identify if each statement is true, false, or cannot be determined. (1 point each)

- 25% of the sophomores spend between 48 & 60 minutes per night on homework.
- 15% of the sophomores didn't watch TV that month.
- In general, these sophomores spend more time watching TV than on other screen time.
- The ratio of sophomores who spend more than 110 minutes per night on other screen time to those who spend less is about 2:1.
- Twice as many sophomores watch TV for more than 1 hour than do homework for more than 1 hour.

Part 1: Answer 2 of the following 3 questions in this part. Each problem you complete is worth 20 points.

1) Amount of gasoline purchased by 28 drivers:

7	4	18	4	9	8	8
7	6	2	9	5	9	12
4	14	15	7	10	2	3
11	4	4	9	12	5	3

a) Construct a frequency distribution (*in ascending order*), relative frequency distribution, cumulative frequency distribtuion, and a histogram for each with 6 intervals from the following data set:

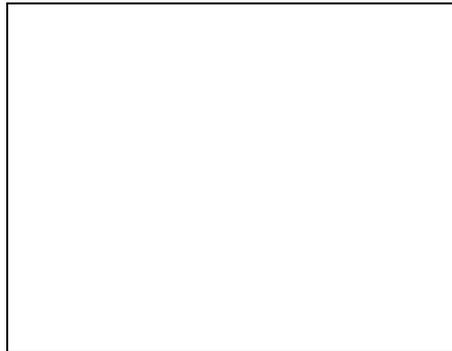
INTERVAL	FREQUENCY	RELATIVE FREQUENCY	CUMULATIVE FREQ.

FREQUENCY HISTOGRAM ----->

Xmin = _____ Ymin = _____

Xmax = _____ YMax = _____

XScI = _____ YScI = _____



b) RELATIVE FREQUENCY HISTOGRAM

Be sure to label each axis

c) CUMULATIVE FREQUENCY HISTOGRAM

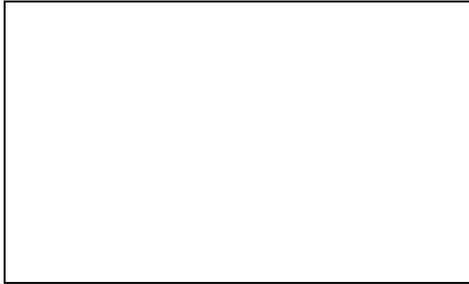
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2) **Temperature vs. Cricket Chirps:** Crickets make a chirping noise by sliding their wings over each other. Perhaps you have noticed that the number of chirps seems to increase with the temperature. The following data list the temperature (Fahrenheit) and the number of chips per second for the striped ground cricket.

Temp (F)	69.4	69.7	71.6	75.2	76.3	79.6	80.6	82	82.6
Chirps/Sec	15.4	14.7	16	15.5	14.4	15	17.1	16	17.1

a) Use your graphing calculator to create a scatter plot of the data. Make a graph of the scatter plot in the accompanying viewing window.



b) Use the regression feature of your graphing calculator to find a linear, quadratic, and an exponential model of the data. Graph each with the scatter plot, and round to three decimal places.

	LINEAR	QUADRATIC	EXPONENTIAL
a			
b			
c	N/A		N/A
r			

c) Identify the best-fit model for the data. _____

d) Using the best-fit model, find the outside temperature (to the nearest tenth of a degree) if a cricket makes 17 chirps a second. _____

e) Using the best-fit model, find the number of chirps per second if the outside temperature is 90.1 degrees. _____

3) In the table below, the average monthly temperatures for Pullman and Seattle are shown.

Month	Pullman	Seattle
January	34.5	14.7
February	40.5	40.1
March	47.0	53.4
April	55.9	59.4
May	64.4	66.7
June	71.2	71.2
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August	81.9	76.3
September	72.8	71.0
October	59.8	61.3
November	43.7	52.0
December	35.9	47.1

a) Perform the five number summary for each city.

	PULLMAN	SEATTLE
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

b) Draw a box & whisker graph to scale for each city from the data on the same number line

c) Find the interquartile range, the lower and the upper fence values for Seattle's average monthly temperatures.

Interquartile Range = _____ Lower Fence = _____ Upper Fence = _____

d) Identify any outliers for the data: _____

e) Construct a modified box plot for Seattle's average monthly temperature.

f) Find the percent increase from February to March for Pullman's average monthly temperature to the nearest tenth of a percent.

Part 2: Answer 4 of the following 6 questions in this part. Each problem you complete is worth 15 points.

4) The following are data on weekend exercise time for 20 females consistent with summary quantities in the paper, "An Ecological Momentary Assessment of the Physical Activity and Sedentary Behavior Patterns of University Students" (*Health Education Journal* [2010])

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45.5 39.5 6.5 34.5 0.0 14.5 40.5 44.5 54.0 0.0

a. Calculate the mean, median, and standard deviation for the data. Round to the nearest tenth if necessary.

MEAN = _____ MEDIAN = _____ STANDARD DEVIATION = _____

b. Find the percent of the data that lies outside of 1 standard deviation of the mean.

c. Find the 5 % and the 10 % trimmed mean for the data to the nearest tenth.

5 % Trimmed Means = _____ 10 % Trimmed Means = _____

5) Given the previous statistics exam grades for 20 statistics students,

97, 92, 88, 75, 83, 67, 89, 55, 72, 78, 81, 91, 57, 63, 67, 74, 87, 84, 98, 46

a) Create a stem and leaf plot for the data.

b) Find the nearest score that falls at the 86th percentile for the data. _____

c) Find the nearest score that falls at the 3rd decile. _____

d) Find the percentile rank for a score of 67. _____

7) The stem-and-leaf plot below is used to display the number of vehicles sold by the Ford and Nissan dealerships in a town each week for a three month period.

Ford		Nissan	
7 4		0	3 8 8 9 9
9 5 2 2 1 0		1	1 1 6 6
8 5 4 4		2	2 7 9
0		3	5

Key: 30 = 0 | 3 | 5 = 35

a) Calculate the median of both distributions.

Ford = _____ Nissan = _____

b) Calculate the range of both distributions.

Ford = _____ Nissan = _____

c) Calculate the interquartile range of both distributions.

Ford = _____ Nissan = _____

d) Describe the skewness of the data for the Nissan dealership. _____

8) The total credit card volume for Visa, MasterCard, American Express, and Discover has increased dramatically in recent years, as shown in the table below. (Source, CardWeb Inc.'s CardData)

a) Draw a scatter plot of the data by letting 0 correspond to the year 2000.

Year, x	Credit Card Volume, y (In Billions)
1998	261.0
1999	296.3
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2001	361.0
2002	403.1
2003	476.7
2004	584.8
2005	701.2
2006	798.3
2007	885.2



b) Calculate a cubic regression for the data. Round to three decimal places

a = _____ b = _____ c = _____ d = _____ r = _____

b) Graph the curve on the scatter plot.

c) Use the regression model to predict the credit card volume in 2013 and in 2020 to the nearest tenth of a billion.

2013 = _____

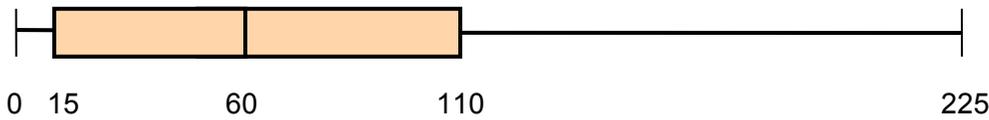
2020 = _____

9) Refer to the box & whisker graphs below that compare homework time per night with other screen time per night for the same group of 28 sophomores.

Screen Time & Homework Time in Minutes per Night



Homework Time



Screen Time

Answer the following questions: (2 points each)

- a) What percent of the sophomores do HW for at least 20 minutes per night? a) _____
- b) What is the upper quartile for the Screen time data? b) _____
- c) What percent of sophomores spent less than 15 minutes on Screen Time? c) _____
- d) How many sophomores spent at most 1 hour doing their homework per night? d) _____
- e) How many sophomores spent more than 1 hour 50 minutes on Screen Time? e) _____

For questions f-j, identify if each statement is true, false, or cannot be determined. (1 point each)

- f) 25% of the sophomores spend between 48 & 60 minutes per night on homework. f) _____
- g) 15% of the sophomores didn't have screen time that month. g) _____
- h) In general, these sophomores spend more time on screen time than on homework. h) _____
- i) The ratio of sophomores who spend more than 110 minutes per night on screen time to those who spend less is about 2:1. i) _____
- j) Twice as many sophomores have screen time for more than 1 hour than do homework for more than 1 hour. j) _____