Name:_____ JMJ April 10, 2017
Trigonometry A2 Trimester 2 Exam 8:40 AM – 10:10 AM Mr. Casalinuovo

Part 1: You MUST answer this problem. It is worth 20 points.

1) **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 it with the scatter plot, and round to three decimal places.
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 16 chirps a second.
e) Using the best-fit model, find the number of chirps per second if the outside temperate is 90.1 degrees.

Part 2: Answer FOUR of the following FIVE problems in this part. Each problem you answer is worth 20 points.

2) **Frequency Distribution and Histograms**

Construct a frequency distribution (*in ascending order*) and a histogram, a cumulative frequency distribution and a cumulative frequency histogram using intervals beginning with 0 gallons and using intervals of size 4:

Amount of gasoline purchased by 21 drivers:

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

3) **Exercise**

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

a. Calculate the mean, median, and standard deviation for the data.

b. Find the percent of the data that is within 2 standard deviations from the mean.

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

4) **Weather**: In the table below, the average monthly temperatures for and Seattle is shown.

Month	Seattle
January	14.7
February	40.1
March	53.4
April	59.4
May	66.7
June	71.2
July	76.9
August	76.3
September	71.0
October	61.3
November	52.0
December	47.1

a) Perform the five number summary.

b) Draw a box & whisker graph from the data.

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

d) Identify any outliers for the data

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

5) Test Scores

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 percentile ranking for a student who scored a 89.

c) Find the score that is at the second decile.

6) **Trade Winds**

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 January 16.

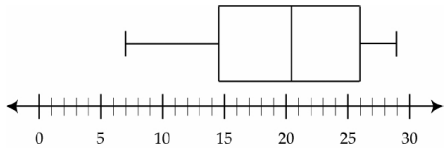
26	14	18	14	113	50	13	22
27	57	28	50	72	105	138	16

a) Calculate the Mean Absolute Deviation for the Data rounding to the nearest tenth.

b) If the day in which the 113 mile reading was incorrect, and it should have measured as 13 mile, by how much (to the nearest tenth) does the average decrease and find the percent decrease.

7) Interpreting Charts and Tables: Answer A) and B).

A) The accompanying box-and-whisker plot represents the cost, in dollars, of sixteen DVD's.



1) Which cost is the lower quartile?
2) What is the range of the costs of the DVD's?
3) What is the median?
4) How many DVD's cost between $14.50 and $29
5) I bought one of the DVD's that cost me $ 20.50. How many DVD's cost more than the one I bought?

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5. The back-to-back stem-and-leaf plot below shows the average monthly temperatures for Seattle, Washington, and Helena, Montana.
   a. Which city has lower monthly temperatures? Explain.
   b. Which city has more varied temperatures?
   c. What is the median monthly temperature for Seattle?
   d. What is the median monthly temperature for Helena?

Seattle, WA	Stem	Helena, MT
	2	016
	3	15
65311	4	45
630	5	36
6511	6	178

$1 \mid 6 = 61^\circ$ $4 \mid 5 = 45^\circ$

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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 16 chirps a second. _____

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

Part 2: Answer FOUR of the following FIVE problems in this part. Each problem you answer is worth 20 points.

2) **Frequency Distribution and Histograms**

Construct a frequency distribution (*in ascending order*) and a histogram, a cumulative frequency distribution and a cumulative frequency histogram using 6 intervals.

Amount of gasoline purchased by 21 drivers:

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

a. Create a frequency distribution and a cumulative frequency distribution.

Intervals	Frequency	Cumulative Frequency

b. Draw a frequency histogram and a cumulative frequency histogram for the data.

FREQUENCY HISTOGRAM **CUMULATIVE FREQUENCY HISTOGRAM**

Xmin = _____ **Ymin = _____**

Xmax = _____ **Ymax = _____**

XScl = _____ **YScl = _____**

BE SURE TO LABEL THE X AND Y-AXIS FOR THE CUMULATIVE HISTOGRAM

3) **Exercise**

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

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

MEAN = _____ MEDIAN = _____ STANDARD DEVIATION = _____

b. Find the percent of the data that is within 2 standard deviations from the mean.

_____

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

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

4) **Weather**: In the table below, the average monthly temperatures for and Seattle is shown.

a) Perform the five number summary. Round to the nearest tenth.

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

Month	Seattle
January	14.7
February	40.1
March	53.4
April	59.4
May	66.7
June	71.2
July	76.9
August	76.3
September	71.0
October	61.3
November	52.0
December	47.1

b) Draw a box & whisker graph to scale from the data on the 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.

_____

5) Test Scores

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 percentile ranking for a student who scored a 89. _____

c) Find the score that is at the second decile. _____

6) **Trade Winds**

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 January 16.

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

a) Calculate the Mean Absolute Deviation for the Data rounding to the nearest tenth.

X

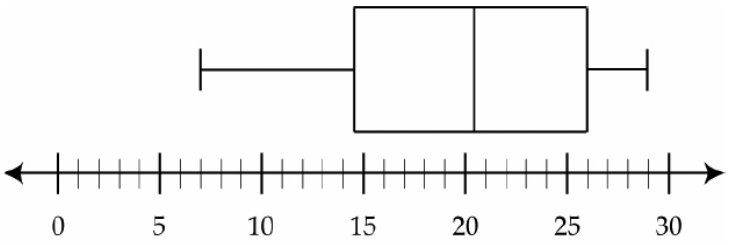
Mean Absolute Deviation = _____

b) If the day in which the 113 mile reading was incorrect, and it should have measured as 13 mile, by how much (to the nearest tenth) does the average decrease and find the percent decrease.

Decrease = _____ Percent Decrease = _____

7) Interpreting Charts and Tables: Answer A) and B).

A) The accompanying box-and-whisker plot represents the cost, in dollars, of sixteen DVD's.



1) Which cost is the lower quartile? 1)_____

2) What is the range of the costs of the DVD's? 2)_____

3) What is the median? 3)_____

4) How many DVD's cost between $14.50 and $29 4)_____

5) I bought one of the DVD's that cost me $ 20.50.
How many DVD's cost more than the one I bought? 5)_____

B) The back-to-back stem-and-leaf plot below shows the average monthly temperatures for Seattle, Washington, and Helena, Montana.

Seattle, WA	Stem	Helena, MT
	2	0 1 6
	3	1 5
6 5 3 1 1	4	4 5
6 3 0	5	3 6
6 5 1 1	6	1 7 8

1 | 6 = 61° *4 | 5 = 45°*

1. Which city has lower monthly temperatures?

_____

2. Which city has more varied temperatures?

_____

3. What is the median monthly temperature for Seattle?

_____

4. What is the median monthly temperature for Helena?

_____