Name: _____ Date: _____

Assignment 1: Measures of Central Tendency & Spread

Expectations

Through this assignment, you will have another opportunity to…

- ☐ …calculate and interpret measures of central tendency (mean, median and mode) and measures of spread (range, standard deviation)
- ☐ …explain when measures of central tendency should be used to represent a data set
- ☐ …identify and describe different distributions of data (e.g., normal, bimodal, skewed)
- ☐ …compare two or more sets of data using the measures of central tendency and spread
- ☐ …create different graphical forms (e.g., histograms, bar graphs, line graphs) to represent collected data

Instructions

Answer each of the problems that follow. Show all thinking. The communication aspect will be assessed using the attached rubric.

Problem 1:

A friend of yours has 20 min to get to their after-school job. Despite their best efforts, they are frequently late and have been tracking how long it takes (in minutes) to get there.

Their recorded times are as follows: {18, 20, 22, 27, 16, 23, 25, 26, 19, 28}.

a) Determine all measures of central tendency for the list of travel times—mean, median and mode.

b) Which measure of central tendency do you think best represents the 'average' time it takes your friend to get to work? Justify your choice.

c) Create a histogram that represents the list of travel times. You may use the grid (template; next page) provided or create your own.

d) Classify your distribution as either normal, uniform, bimodal, or skewed (left or right). Explain your choice.

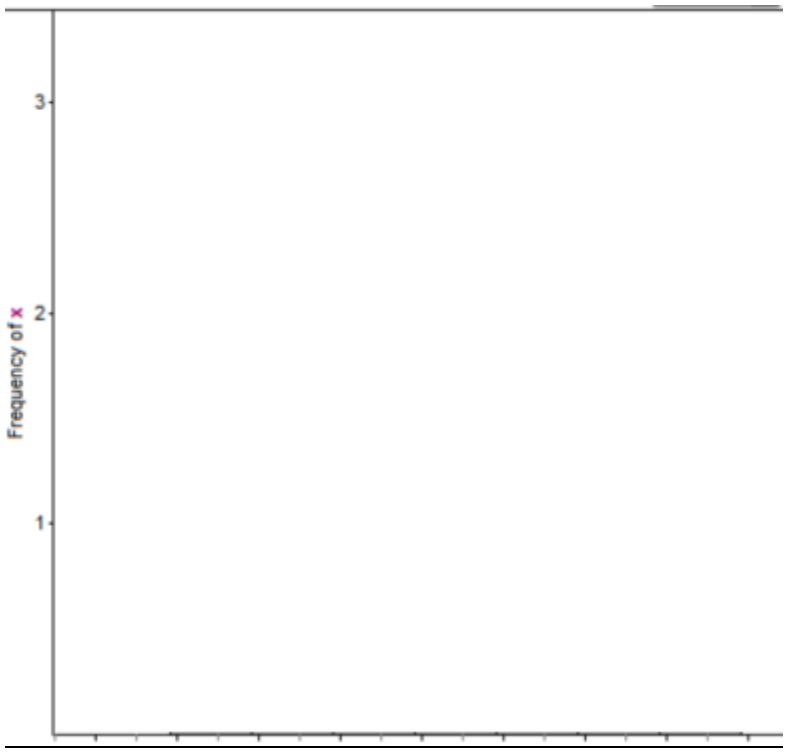
e) Determine the range for the list of times.

f) Determine the standard deviation for the list of times. Organize some of your calculations in the sample table provided. Show all remaining calculations that it takes you to determine the standard deviation.

Time (x min)	x – mean	$(x - \text{mean})^2$
	Total →	

Remaining Calculations

Sample template for your histogram (or build your own)



Some success criteria: 'Must-haves' when designing and completing your solution to #1

Did I…

KU	#1: Incorporate the term "outlier", *if appropriate*, and discuss its potential impact on the value of the mean?	Approaching	On Target	Exceeding
KU	#1: Choose an appropriate bin width? Recall: min of 5 and no more than 20 bins. Bin width = Range / # of bins	Approaching	On Target	Exceeding

KU	#1: Show all steps in the calculation of the standard deviation—organizing your work in the form of a table? If I used technology (e.g., Excel), have I shared this with my teacher? Or have I included a screenshot of the table in my assignment?	Approaching	On Target	Exceeding

Problem 2 (Continued from Problem 1):

Your friend's boss has told them that unless they show more consistency in getting to work, they will lose their job. Over the next two weeks, your friend continues to keep track of the times it's been taking them to get to work.

They record the following times: {22, 20, 22, 24, 24, 23, 25, 21, 19, 21}.

Should your friend lose their job? Use statistics to determine if your friend has (or has not) consistently improved in getting to work in a timely manner.

Some success criteria: 'Must-haves' when designing and completing your solution to #2

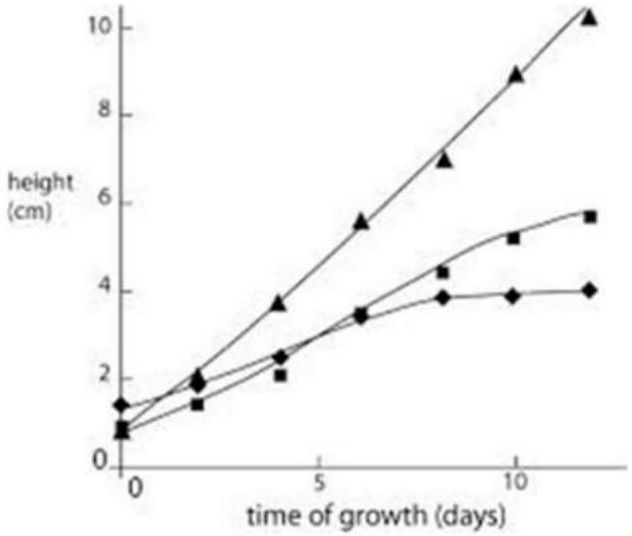
Did I…

KU	#2: Report the calculated values of the mean and standard deviation?	Approaching	On Target	Exceeding
TIPS	#2: Use/discuss how the mean and standard deviation shows which set of times demonstrates greater consistency? If you were the employer, would the mean times be important to you, too? Why or why not?	Approaching	On Target	Exceeding

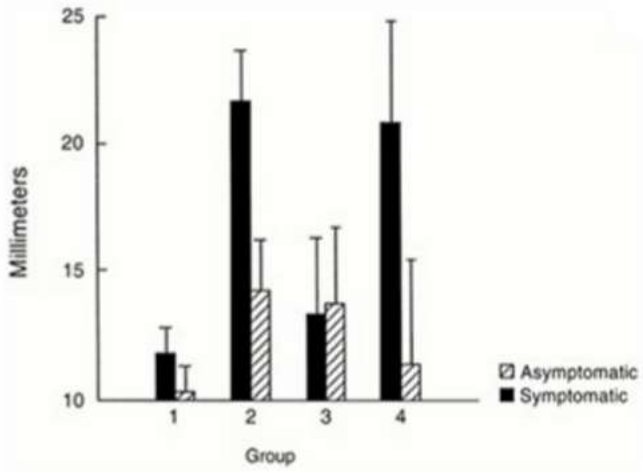
Problem 3:

Which of the following graphs shows *discrete* data? *Continuous* data? Explain your choice.

Graph A



Graph B



Source: http://slideplayer.com/slide/7406736/ Accessed: Feb 21/16

Some success criteria: 'Must-haves' when completing your solution to #3

Did I…

KU	#3: Clearly explain the difference between the types of data being used to create each of the graphs?	Approaching	On Target	Exceeding

Communication Rubric Name:

Level 1	Level 2	Level 3	Level 4
Misinterprets a major part of the information, but carries on to make some otherwise reasonable statements	Misinterprets part of the information, but carries on to make some otherwise reasonable statements	Correctly interprets the information, and makes reasonable statements	Correctly interprets the information, and makes subtle or insightful statements
Sometimes uses mathematical symbols, labels and conventions correctly	Usually uses mathematical symbols, labels and conventions correctly	Consistently uses mathematical symbols, labels and conventions correctly	Consistently and meticulously uses mathematical symbols, labels and conventions, recognizing novel opportunities for their use
Sometimes uses mathematical vocabulary correctly when expected	Usually uses mathematical vocabulary correctly when expected	Consistently uses mathematical vocabulary correctly when expected	Consistently uses mathematical vocabulary correctly, recognizing novel opportunities for its use
Either mathematical or narrative form is present, but not both	Both mathematical and narrative forms are present, but the forms are not integrated	Both mathematical and narrative forms are present and integrated	A variety of mathematical forms and narrative are present, integrated and well chosen
Explanations and justifications are partially understandable	Explanations and justifications are understandable by me, but would likely be unclear to others	Explanations and justifications are clear for a range of audiences	Explanations and justifications are particularly clear and detailed

Communication Comments:

Overall Assessment:

KU	Approaching	On Target	Exceeding
TIPS	Approaching	On Target	Exceeding
COMM	Approaching	On Target	Exceeding