

Suggested Answers for WarmUps for Lesson Three	
1.	Look up the word "hierarchy" in a dictionary. Paraphrase the definition and explain how what you know about the types &/ levels of data is an example of that definition.
Answer	A "hierarchy" is a categorization of individuals or groups of people or things organized sequentially (increasing or decreasing) according to ability, status or the possession of a certain level of a characteristic. The data levels nominal to ordinal to interval represent a hierarchy. What is increasing from nominal to ordinal to interval is the number of statistical techniques which can be used on the type of data. It could also be said that movement from nominal to ordinal to interval results in increasing information contained in any one data point
2.	Write a rule that will allow you to determine if a quantitative variable is discrete or continuous. Be very complete.
Answer	Ask: "Is it possible to divide an odd valued observation in half and still have an appropriate response to the question which generated the data? If so, the variable is continuous; if not, it is discrete.
3.	How will you be sure the samples you use in the future are appropriate to use for statistical calculations? What do you need to know or look for?
Answer	Statistical techniques are appropriate for use on simple random samples. The method used to select the items in the sample must be carefully explained so that it is clear that selections were random and independent.
4.	This is question 2.27 from your text. What would be the difference in student responses to the two questions shown? Version 1) I would prefer that tuition be reduced. Version 2) Cuts in tuition are a good idea even if some classes are canceled. Explain.
Answer	The first question is broad and simple and it would be hard to generate a negative response to it, thus resulting in an impression of broad spread support for reducing tuition. The second provides context for the suggested change and gives an example of the cost of agreeing with the statement. It is likely that a variety of responses will be generated which should give a more accurate picture of the sentiments of the group being polled.
5.	Explain the relationship between class limits, class marks and class intervals. Be complete.
Answer	Class limits are the lower and upper end points of classes. If the class limits are averaged in each class the value that results is the class mark or midpoint. If the lower limit is subtracted from the upper limit the resulting value is the class interval or width. The three concepts are connected mathematically. If one knows two of the three, the third can always be calculated.
6.	What is the difference between "mutually exclusive" and "collectively exhausted" with respect to classes in frequency distributions?
Answer	A difference is that mutual exclusivity is defined between classes and collectively exhaustive is defined among all classes. Mutually exclusive refers to well-defined classes that do not overlap or cause any ambiguity about what class an item is to reside in. Collectively exhaustive refers to there being sufficient classes that every item has a class in which to reside. The two terms do not depend on one another. Classes can be mutually exclusive but not collectively exhaustive, and vice versa. Furthermore, classes can be neither mutually exclusive nor collectively exhaustive, and vice versa.
7.	Use the data set you can access here. Create a stem-and-leaf plot of this data.

	Explain step by step how you did it.
Answer	<p>1. Sort data low to high</p> <p>2. Determine stems: since the data ranges from 43 to 108 selecting stems from the 10's position in the value will work as stems, using 10 as the last stem.</p> <p>3. List Stems vertically.</p> <p>4. Add leaves, the value in the 1's position in the observations, making certain to write them from lowest to highest and that I have as many stems as I have observations in the data set, 100.</p> <p>5. Draw a vertical line between the stems and the first leaves on each.</p> <pre> 4 3 8 8 9 9 5 0 0 0 0 0 1 2 3 3 4 4 4 4 6 7 7 7 8 8 8 9 6 0 0 0 0 0 1 2 2 2 5 5 6 8 9 7 1 1 1 3 3 3 4 4 4 5 5 6 6 7 7 7 8 8 9 9 9 8 0 0 0 0 0 0 1 1 1 1 1 1 1 2 2 2 3 3 4 4 5 5 6 6 7 7 7 7 8 8 9 9 9 0 1 2 2 3 3 10 8 </pre>
8.	Graphs are used to "reveal characteristics of data." What characteristics of the data could be revealed by graphs?
Answer	Important data characteristics include some measure of "location," where the data set is located on the number line, such the middle value, a very common value or a value where the two sides balance, some measure of relative "spread", how far the highest and lowest value are from one another, or some average of the distance between values in the data set, and "shape", is the data symmetric in appearance or does it cluster at one or the other end of the data set? Additionally, the location and number of concentrations of data—peaks, for example, are important characteristics. All of these can be revealed by graphs of data.