

You need to show all work and be clear and concise in your explanations

**1. WHICH BATTERIES ARE BETTER?** The back-to-back stemplot shows the lifetimes of several Brand X and Brand Y batteries.

Brand X		Brand Y
	1	
	1	7
	2	2
	2	6
2110	3	
99775	3	
3221	4	223334
	4	56889
4	5	0
5	5	

- (a) What is the longest that any battery lasted?
- (b) Using your calculator, find the numerical summaries ( $\bar{x}$ ,  $s_x$ , and the five number summary) for both sets of data. Are there any outliers? Calculate. Is there anything unusual?
- (c) Draw a modified boxplot. Using the boxplot, compare and contrast battery life for each brand.
- (d) Give a reason someone might prefer a Brand X battery?
- (e) Give a reason someone might prefer a Brand Y battery?

**2.  $\bar{x}$  AND  $s$  ARE NOT ENOUGH** The mean  $\bar{x}$  and standard deviation  $s$  measure center and spread but are not a complete description of a distribution. Use your calculator to find  $\bar{x}$  and  $s$  for the following two data sets.

<b>Data A:</b>	9.14	8.14	8.74	8.77	9.26	8.1	6.13	3.1	9.13	7.26	4.74
<b>Data B:</b>	6.58	5.76	7.71	8.84	8.47	7.04	5.25	5.56	7.91	6.89	12.5

- (a) What do you notice about the mean and standard deviation for both data sets?
- (b) Make a back-to-back stemplot and **comment** on the shape of each distribution.

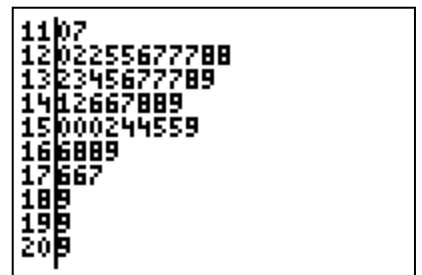
**3. WHO HAS THE RIGHT TIME?** Since Hill Valley High School eliminated the use of bells between classes, teachers have noticed that more students seem to be arriving to class a few minutes late. One teacher decided to collect data to determine whether the students' and teachers' watches are displaying the correct time. At exactly 12:00 noon, the teacher asked 9 randomly selected students and 9 randomly selected teachers to record the times on their watches to the nearest half minute. The ordered data showing minutes after 12:00 as positive values and minutes before 12:00 as negative values are shown in the table below.

<b>Students</b>	-4.5	-3	-0.5	0	0	0.5	0.5	1.5	5
<b>Teachers</b>	-2	-1.5	-1.5	-1	-1	-0.5	0	0	0.5

- (a) Construct parallel boxplots using these data.
- (b) Based on the boxplots in part (a), which of the two groups, students or teachers, tends to have watch times that are closer to the true time? Explain your choice.

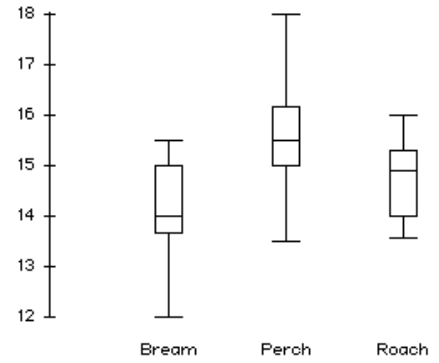
**4.** The stemplot displays the 1988 per capita income (in hundreds of dollars) of the 50 states. Which of the following best describes the data?

- (a) Skewed distribution, mean greater than median
- (b) Skewed distribution, median greater than mean
- (c) Symmetric distribution, mean greater than median
- (d) Symmetric distribution, median greater than mean
- (e) Symmetric distribution with outliers on high end

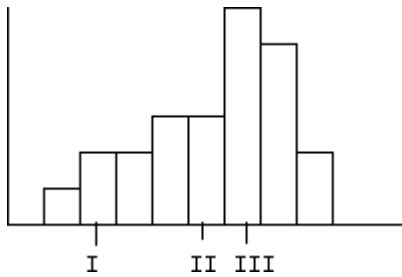


5. A study was conducted on the weights of three different species of fish found in a lake in Finland. These three fish (bream, perch and roach) are commercial fish. Their weights are displayed in the boxplots below. Which of the following statements comparing these boxplots is **NOT** correct?

- (a) The median weights of the three species differ.
- (b) The spread of roach is less than the spread of the other two species.
- (c) The distributions of weights are approximately symmetric for all three species.
- (d) There are no outliers in weight for the three species.
- (e) The variability in the weights for the three species exceeds the variation in the three species' means.



6. For the following histogram, what is the proper ordering of the mean, median, and mode? Note that the graph is NOT numerically precise - only the relative positions are important.



- (a) I = mean, II = median, III = mode
- (b) I = mode, II = median, III = mean
- (c) I = median, II = mean, III = mode
- (d) I = mode, II = mean, III = median
- (e) I = mean II = mode III = median

7. The following is a histogram showing the actual frequency of the closing prices on the New York exchange of a particular stock. Based on the frequency histogram for New York Stock exchange, the class that contains the 80th percentile is:

- (a) 20-30
- (b) 10-20
- (c) 40-50
- (d) 50-60
- (e) 30-40

