

Text Exercise Set 6

NAME:

- 6-1** In Exercise 4-1, the weight of chocolate in each of several of chocolates produced by the Sweetuthe Company at two locations, one on the east coast and one on the west coast, were recorded with weight measured in pounds, as follows:

East Coast 4.14 3.99 4.06 4.15 4.18 4.26 4.03 4.12 4.19 3.98 4.09 4.24 3.96 4.01
West Coast 4.13 3.94 3.93 4.00 3.90 4.40 4.07 3.97 4.35 3.95 3.91

The mean and median for the east coast weights were found to be 4.10 and 4.105 pounds respectively; the mean and median for the west coast weights were found to be 4.05 and 3.97 pounds respectively.

- (a) Find the standard deviation for the east coast weights; then find the standard deviation for the west coast weights.

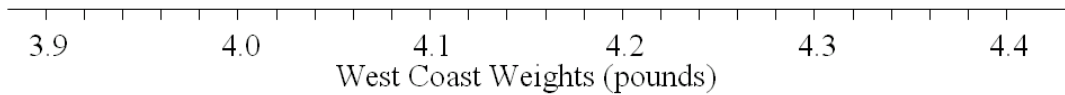
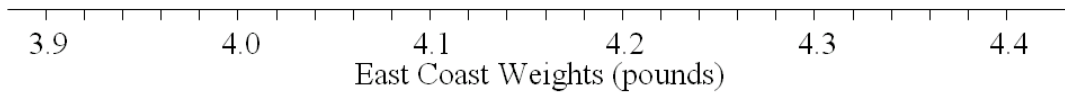
- (b) Do the standard deviations found in part (a) suggest that the distribution of weights shows a different amount of dispersion for the two locations? If yes, for which location does the amount of dispersion appear to be greater?

- (c) Find the skewness ratio for the east coast weights; then find the skewness ratio for the west coast weights.

- (d) What do the skewness ratios found in part (c) suggest about the shape of the distribution of weights at each of the two locations?

6-1 - continued

- (e) For each location, construct a dot plot of the weights and a stem-and-leaf display of the weights. Does what you see in these graphical displays support your answers to parts (b) and (d)?



Stem-and-Leaf for
East Coast Weights (pounds)



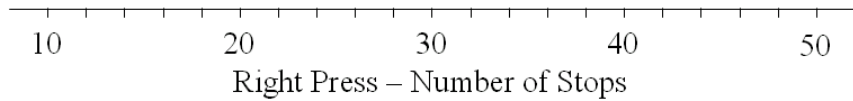
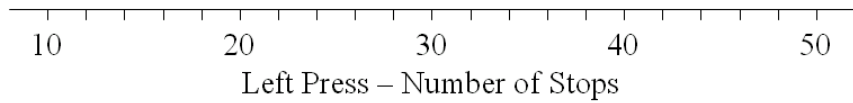
Stem-and-Leaf for
West Coast Weights (pounds)



- (f) Make up new weights for the east coast and new weights for the west coast so that the means are still 4.10 and 4.05 respectively, but the standard deviations are both zero.
- (g) Make up new weights for the east coast and new weights for the west coast so that the means are both the same, and the standard deviations are both zero.

6-2 - continued

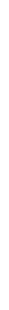
- (e) For each press, construct a dot plot of the number of stops and a stem-and-leaf display of the number of stops. Does what you see in these graphical displays support your answers to parts (b) and (d)?



Stem-and-Leaf for
Left Press Number of Stops



Stem-and-Leaf for
Right Press Number of Stops

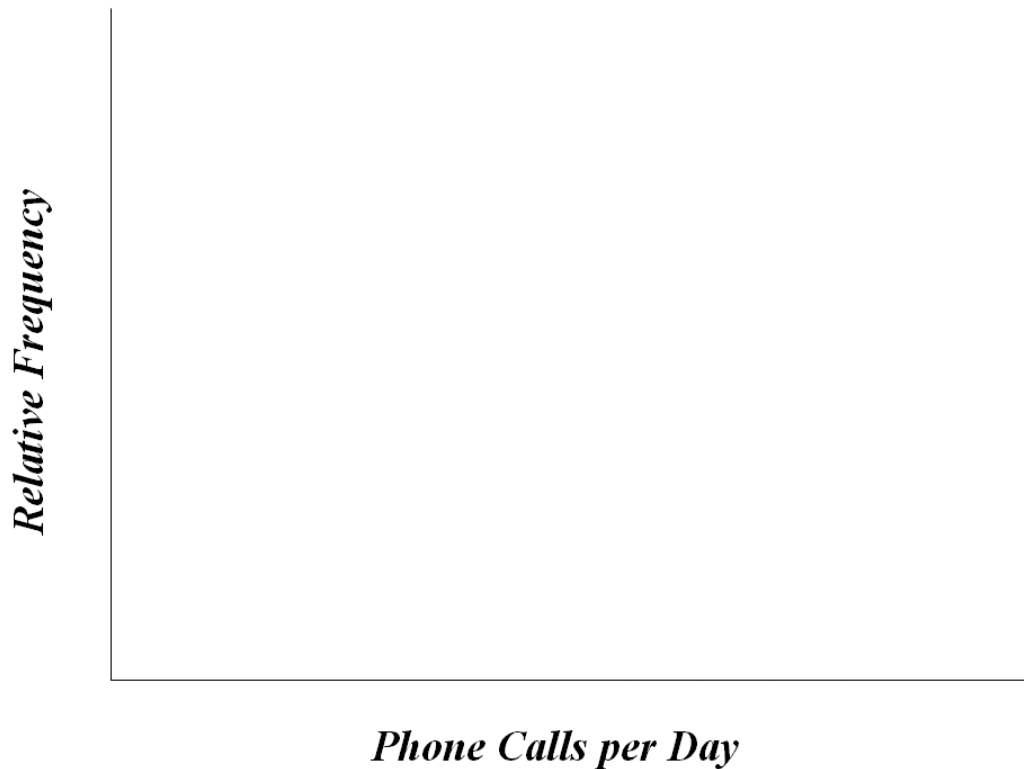


- (f) Make up new observations for each of the presses so that the means are still 26.25 for the left press and 27 for the right press, but the standard deviations are both zero.
- (g) Make up new observations for each of the presses so that the means are both the same, and the standard deviations are both zero.

6-3 In Exercise 4-3, the number of phone calls to a certain office was recorded each day for 100 days, and the results were organized into the frequency table displayed as Table 4-4 (which is redisplayed here on the right). The mean and median number of phone calls per day were found to be 8.15 and 8 calls respectively.

Phone Calls per Day	
<u>Number of Calls</u>	<u>Raw Frequency</u>
5	10
6	11
7	13
8	24
9	21
10	14
11	0
12	4
13	3

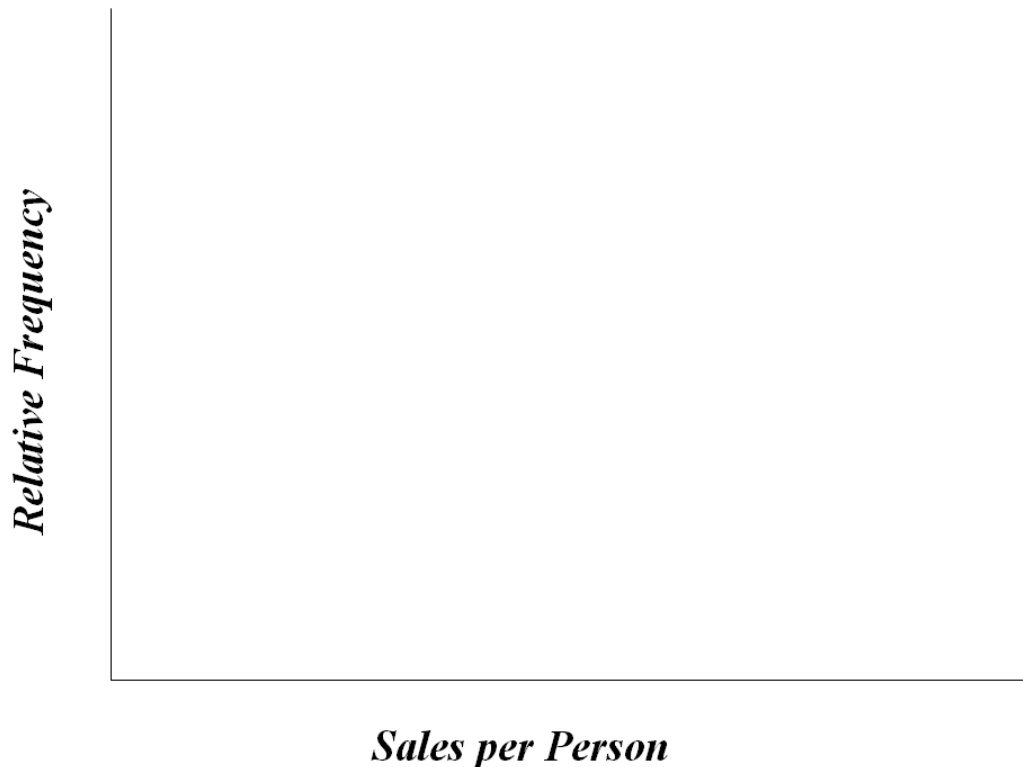
- (a) Find the standard deviation for the number of phone calls per day.
- (b) Find the skewness ratio for the number of phone calls per day, and indicate what this suggests about the shape of the distribution.
- (c) Construct a frequency polygon for the number of phone calls per day. Does the shape of the frequency polygon support your answer to part (b)?



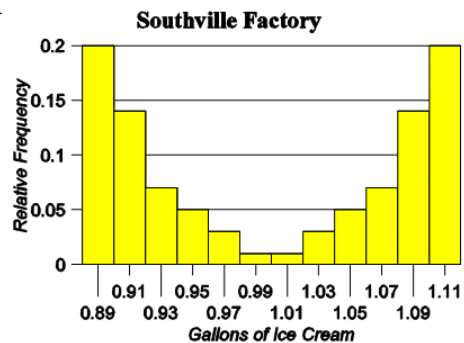
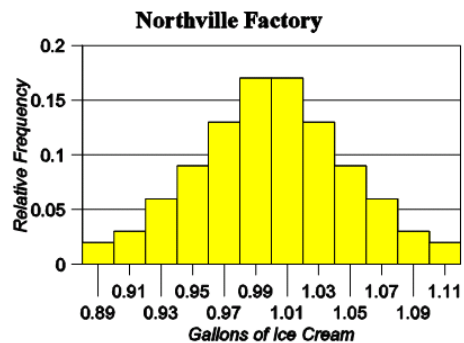
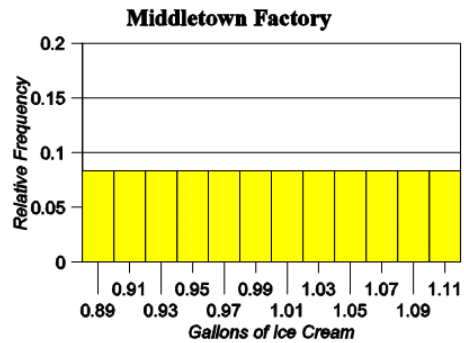
6-4 In Exercise 4-4, the number of sales during the last week by each salesperson in an office was recorded, and the results were organized into the frequency table displayed as Table 4-5 (which is redisplayed here on the right). The mean and median number of sales per person were found to be 7.2 and 7 sales respectively.

<u>Number of Sales</u>	<u>Raw Frequency</u>
3	2
4	5
5	7
6	10
7	19
8	15
9	8
10	5
11	4

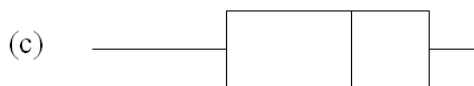
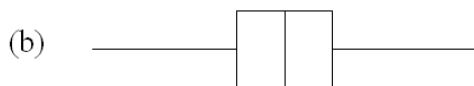
- (a) Find the standard deviation for the number of sales.
- (b) Find the skewness ratio for the number of sales, and indicate what this suggests about the shape of the distribution.
- (c) Construct a frequency polygon for the number of sales. Does the shape of the frequency polygon support your answer to part (b)?



6-5 Exercise 4-10 displays a histogram of the amount of ice cream per container for each of three factories, one in Northville, one in Middletown, and one in Southville (and these are redisplayed here on the right). Indicate for which factory or factories the standard deviation is going to be the largest, and for which factory or factories the standard deviation is going to be the smallest.



6-6 Exercise 5-3 displays several box plots, which are redisplayed below in parts (a) through (e). Assuming the box plots are all on exactly the same scale, complete the instructions to the right of the box plots.



Circle the response corresponding to the box plot whose data is likely to result in the larger standard deviation for each of the following pairs:

(a) or (b) or neither

(a) or (d) or neither

(c) or (e) or neither

(b) or (d) or neither

Table 6-3
Eastville Times to
Hold Breath Under Water

<u>Time in Seconds</u>	<u>Raw Frequency</u>
Above 0 to 10	20
Above 10 to 20	21
Above 20 to 30	20
Above 30 to 40	23
Above 40 to 50	22
Above 50 to 60	19

Table 6-4
Westville Times to
Hold Breath Under Water

<u>Time in Seconds</u>	<u>Raw Frequency</u>
Above 0 to 10	15
Above 10 to 20	20
Above 20 to 30	29
Above 30 to 40	25
Above 40 to 50	22
Above 50 to 60	14

- 6-7** The number of seconds each student could hold his/her breath underwater is recorded for 125 students at Eastville high school and 125 students at Westville high school. The results are organized into the two frequency distributions displayed as Tables 6-3 and 6-4.
- (a) Without doing any calculations, indicate what difference, if any, there will be in the standard deviation of times between the two high schools.
- (b) Without doing any calculations, indicate what difference, if any, there will be in the skewness ratio of times between the two high schools.

Table 6-5
Gas Mileage of
Cheepo Rental Vehicles

<u>Time in Seconds</u>	<u>Raw Frequency</u>
Above 10 to 15	2
Above 15 to 20	4
Above 20 to 25	7
Above 25 to 30	10
Above 30 to 35	11
Above 35 to 40	14
Above 40 to 45	15
Above 45 to 50	12

Table 6-6
Gas Mileage of
Supremo Rental Vehicles

<u>Time in Seconds</u>	<u>Raw Frequency</u>
Above 10 to 15	12
Above 15 to 20	15
Above 20 to 25	14
Above 25 to 30	11
Above 30 to 35	10
Above 35 to 40	7
Above 40 to 45	4
Above 45 to 50	2

- 6-8** The gas mileage in miles per gallon (mpg) is recorded for each of 75 vehicles owned by the Cheepo Rental Agency and for each of 75 vehicles owned by the Supremo Rental Agency. The results are organized into the two frequency distributions displayed as Tables 6-5 and 6-6.
- (a) Without doing any calculations, indicate what difference, if any, there will be in the standard deviation of gas mileage between the two rental agencies.
- (b) Without doing any calculations, indicate what difference, if any, there will be in the skewness ratio of gas mileage between the two rental agencies.

6-9 For each of the data sets described, indicate whether or not obtaining a skewness ratio would be meaningful, and state why or why not.

(a) The highest academic degree earned (No Degree, High School Degree, Associate's Degree, Bachelor's Degree, Master's Degree, Doctoral Degree) is recorded for each of 200 residents of a city.

(b) The temperatures at noon on a particular day is recorded for each of 200 cities.

(c) Which of three candidates for mayor a voter intends to vote for in an upcoming election is recorded for each of 200 voters of a city.

6-10 For each of the data sets described, indicate whether or not obtaining a skewness ratio would be meaningful, and state why or why not.

(a) The race (White, Hispanic, Black, Asian, Other) is recorded for each of 200 residents of a city.

(b) The age in years of each car that passes a particular intersection during a designated three-hour time period is recorded.

(c) Which of the 10 stores in shopping center a shopper spends the most time in is recorded for each of 200 shoppers.

(d) Each of 200 residents of a city are classified into one of four categories depending on how often they ride the city busses (never, occasionally, one or two days a week, almost every day or every day).