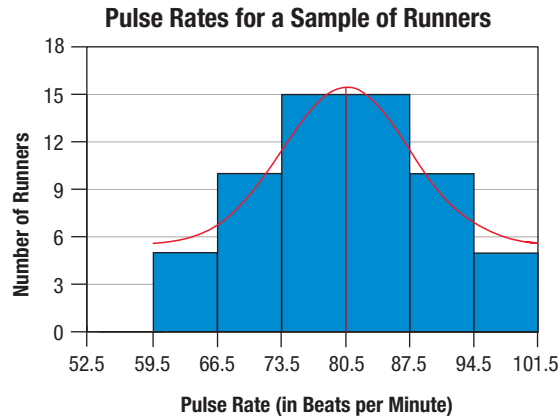


### Solution

Notice that if we draw a smooth curve skimming the top of the histogram, we begin to see a curve similar to the shape of the symmetric curve. To be symmetric, the left and right sides of the graph should be close to mirror images. Drawing a line down the center of the graph, we can see that both sides of the graph are indeed mirror images of each other.



Thus, this histogram has a symmetric shape.

### Summary

When analyzing a graph, there are several things you should consider. First, look at the title, the labels on the axes, the source, and how recently the data was published. Next, consider the overall picture that the graph is depicting. What is the graph trying to show? Is the type of graph that is used appropriate for the data being displayed? Lastly, consider the shape of the graph. Are there any outliers? These considerations should help you come to a clear conclusion regarding the meaning of the graph.

## 2.3 Section Exercises

### Time-Series vs. Cross-Sectional Graph

*For each graph described below, decide whether it is a time-series or a cross-sectional graph.*

1. A map of Louisiana has the individual parishes shaded to represent the average income level for each parish.
2. A line graph depicts the change in the minimum wage since 1965.
3. A bar graph displays the average SAT scores each year for the last five years.
4. A stem-and-leaf plot displays the number of home runs hit by each player on the Yankees ball club.

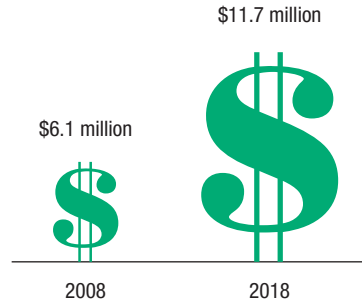
### Analyzing Graphs

*Use the given graphs to answer the questions.*

5. Consider the following pictograph used to display the increase in funds donated to one university's scholarship program.
  - a. By what percentage did funds to the university scholarship program increase between 2008 and 2018?

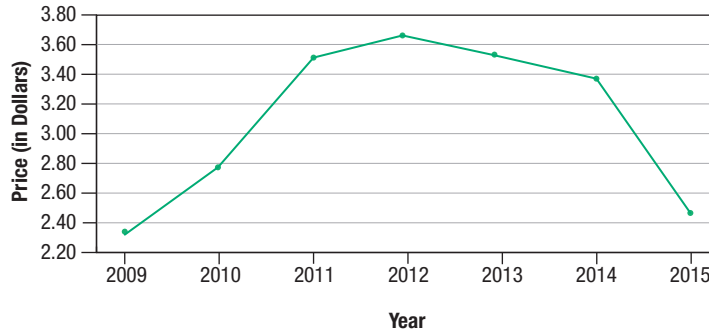
- b. Does the graph shown accurately depict the change in scholarship funds? Explain your answer.
- c. What changes could be made to better display the given information?

**Scholarship Program Donations**



- 6. Does the scale on the following graph depict the situation accurately? Why or why not?

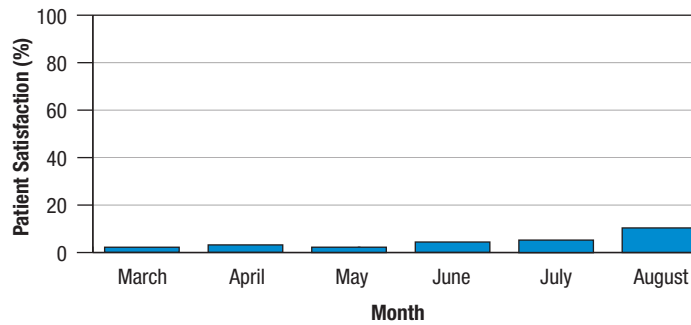
**October US Retail Gasoline Prices, Regular Grade**



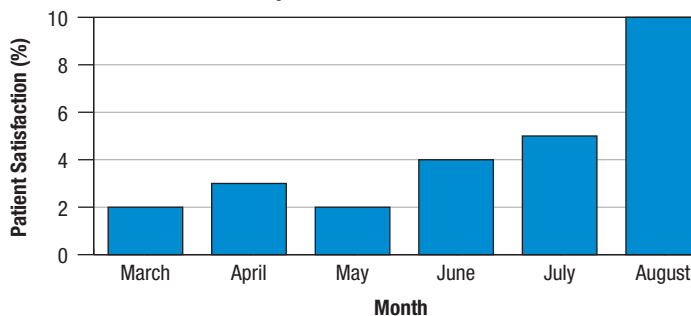
Source: Gringer, Bonnie. "Gas Prices Through History." <https://www.titlemax.com/discovery-center/planes-trains-and-automobiles/average-gas-prices-through-history/> (24 July 2019).

- 7. Look at the two graphs shown below depicting the *same* data on people's overall satisfaction level with the care they received at their local hospital. Which of these two graphs gives a more accurate picture of hospital satisfaction? Has hospital satisfaction increased? Are people satisfied with the care at their local hospital according to these graphs? How do you know?

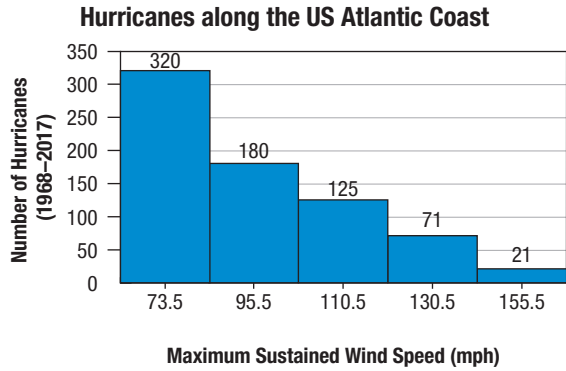
**Hospital Satisfaction A**



**Hospital Satisfaction B**

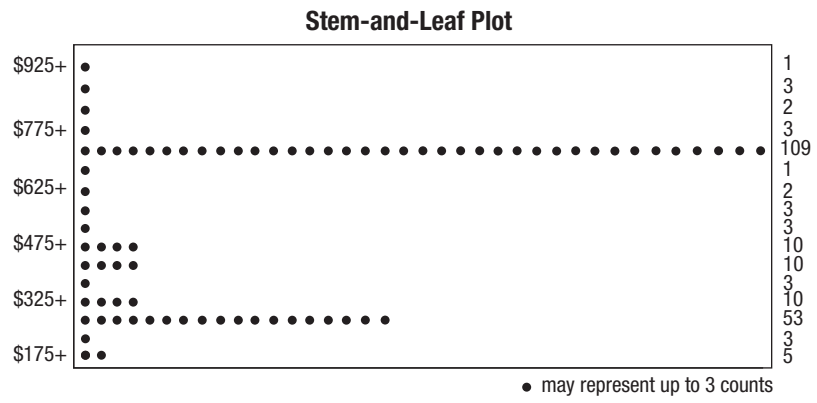


8. What errors occur in the following histogram?



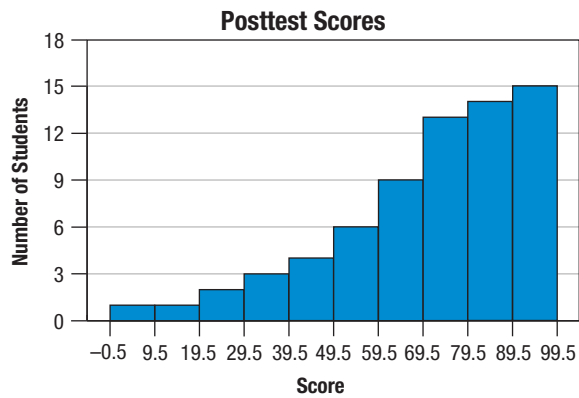
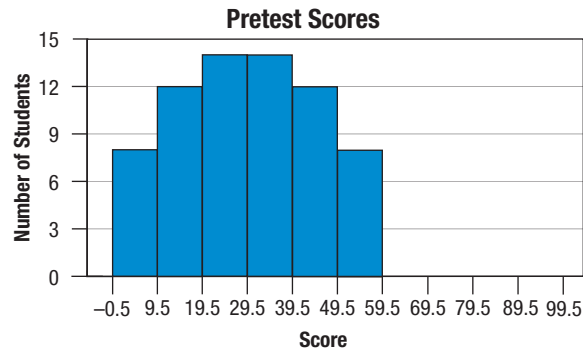
Source: Wikipedia. Atlantic hurricane season. [https://en.wikipedia.org/wiki/Atlantic\\_hurricane\\_season#Number\\_of\\_storms\\_of\\_each\\_strength\\_since\\_the\\_satellite\\_era](https://en.wikipedia.org/wiki/Atlantic_hurricane_season#Number_of_storms_of_each_strength_since_the_satellite_era) (18 July 2019).

9. Consider the following excerpt from an online publication. Is the graph correctly labeled? If not, identify the corrections needed.



Source: NHHealthCost.org. "Health Costs for Consumers - Methodology." 16 Feb. 2007. <http://www.nhhealthcost.org/method.aspx> (24 Jan. 2012).

10. A pretest and a posttest were administered to one class at the beginning and end of two weeks of classes. The scores for each of the tests are shown graphically below.



- a. Identify the general shape of the distribution of pretest scores.
- b. Identify the general shape of the distribution of posttest scores.
- c. Why do you think that the pretest scores are distributed the way they are?
- d. Why do you think that the posttest scores are distributed the way they are?

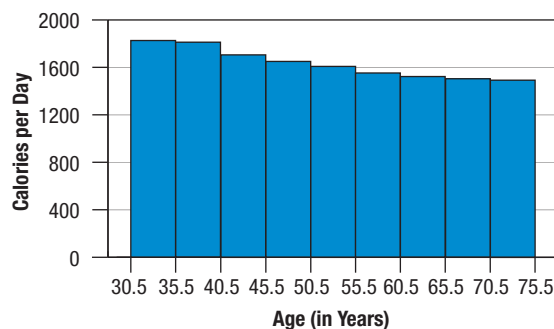
### Shapes of Graphs

*For each set of data described below, discuss the most likely shape of its distribution.*

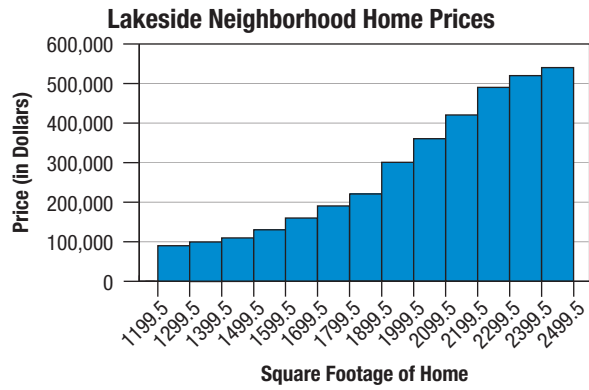
11. The weights of the defensive linemen on football teams in the Big Ten Conference.
12. The lengths of the pregnancies of a group of gorillas being studied in the wild.
13. The last four digits used to generate telephone numbers.
14. The income levels of a group of professional baseball players.

*For each set of data displayed below, choose which of the four shapes defined in this section best describes the distribution.*

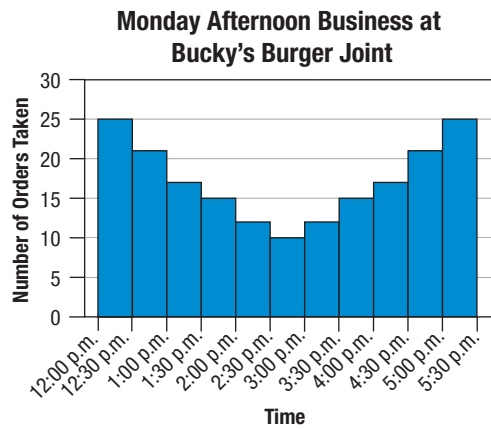
15. **Average Resting Metabolic Rates**



16.



17.



18.

