1. The histograms in Figure 116 and Figure 117 describe the percentages of adults who exercise for each of the 50 states. Figure 116 uses class widths of 3 percentage points, and Figure 117 uses class widths of 4 percentage points.

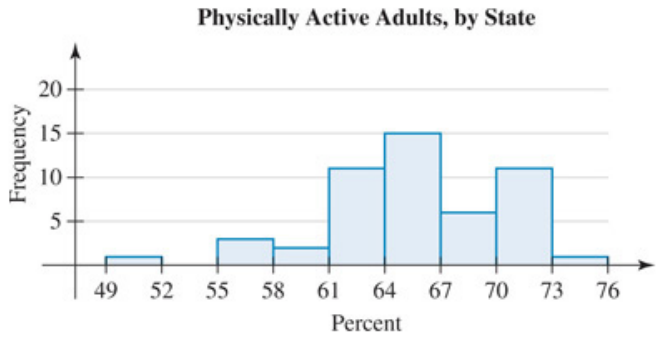

Figure 116 Using a smaller class width to describe percentages of adults who exercise

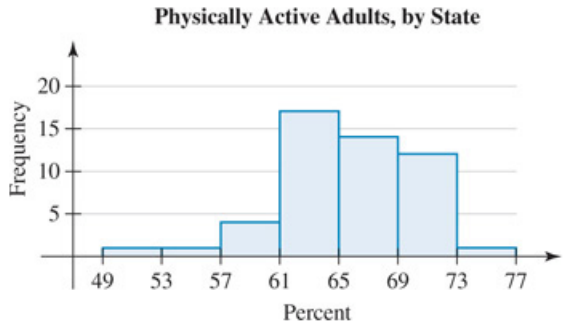

Figure 117 Using a larger class width to describe percentages of adults who exercise

a. Describe the shape of the distribution as it appears in Figure 116.

b. Describe the shape of the distribution as it appears in Figure 117.

c. It turns out that the center of the exercise distribution for the West is about 6 percentage points greater than the center of the exercise distribution for the rest of the country. Which of the two histograms suggests this? Explain.

d. Tennessee has the lowest percentage of adults who exercise. Estimate that percentage.

e. With which histogram can you determine the number of states where the percentage of adults who exercise is at least 70% AND less than 73%? Find that number of states.

2. The percentages of commuters who walk to work are described by the bar graphs in Figures 120 and 121 for the five cities with the highest percentages.

Figure 120 Vertical axis starting at 0%

Figure 121 Vertical axis starting at 8%

a. If Boston's mayor's office wants to convince people that the percentage of commuters who walk is much higher in its city than in any other city, which bar graph would it display? Explain.

b. If San Francisco's mayor's office wants to promote its city as being almost as much of a walking-commuter city as Washington, which bar graph would it display? Explain.

c. From which bar graph are you more likely to better estimate the percentage for San Francisco? Explain. Estimate the percent.

d. There are approximately 467.9 thousand commuters in Honolulu. Estimate the *number* of commuters who walk to work in Honolulu.

e. There are approximately 3.64 million commuters in New York City and 0.36 million commuters in Boston. For each city, estimate the percentage of commuters who walk to work and estimate the number of commuters who walk to work. Which pair of results would New York City's mayor's office highlight if it wants to promote its city as being more of a walking-commuter city than Boston?

3. Freshman tuitions (in thousands of dollars) at Penn State Harrisburg are described by the time-series plots in Figures 124 and 125 for various years, where the starting year of each academic year is shown on the horizontal axis.

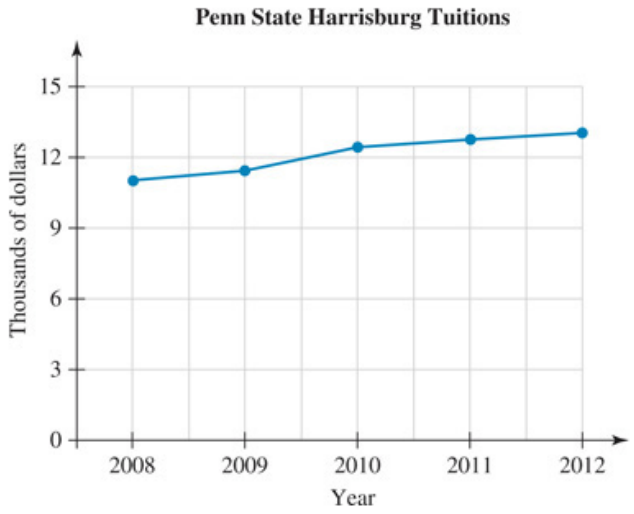

Figure 124 Vertical axis starting at $0 thousand

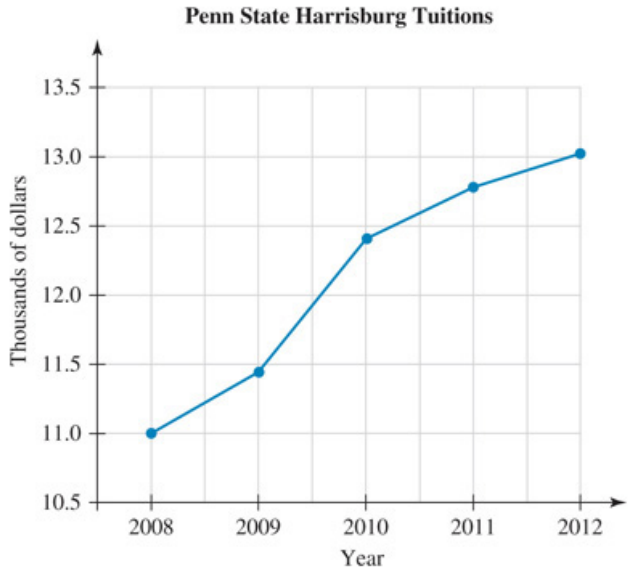

Figure 125 Vertical axis starting at $10.5 thousand

a. If the college wants to de-emphasize how much its tuition has increased, which time-series plot would it want to display? Explain.

b. From which time-series plot can you better estimate the tuition in 2011? What is that tuition?

c. From which year to the next did the tuition change the most? Estimate that change.

d. Estimate the change in tuition from 2008 to 2012. If the tuition were to change that same amount from 2012 to 2016, what would the tuition be in 2016? Do you have much faith that your result will turn out to be true? Explain.

4. The United States' market shares (percentages) of world manufacturing are described by the time-series plots in Figures 128 and 129 for various years.

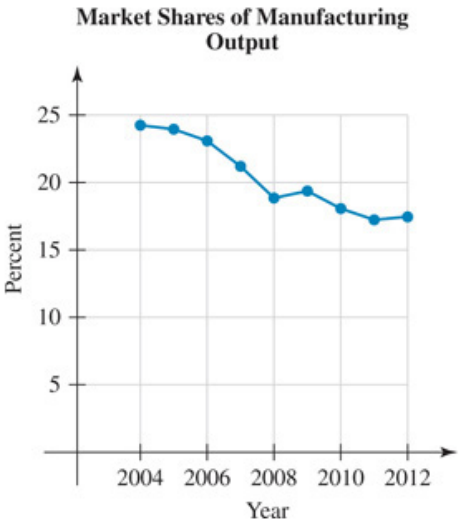

Figure 128 Vertical axis starting at 0%

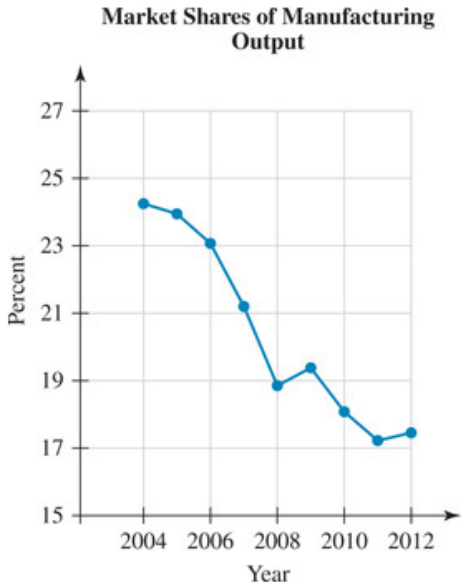

Figure 129 Vertical axis starting at 15%

a. If the Obama administration wants to de-emphasize how much the U.S. market share of world manufacturing has decreased, which time-series plot would it display? Explain.

b. If the Republican Party wants to emphasize how much the market share has decreased, which time-series plot would it display? Explain.

c. From which time-series plot are you more likely to better estimate the market share in 2010? Explain. Estimate the market share in that year.

d. Estimate the change in market share from 2004 to 2012. If the market share were to change that same amount from 2012 to 2020, what would be the market share in 2020? Do you have much faith that your result will turn out to be true? Explain.

e. World manufacturing output was $11.4 trillion in 2012. Estimate the U.S. manufacturing output in that year.

5. The annual revenues (in billions of dollars) of eBay® are described by the bar graph in Figure 131 for various years.

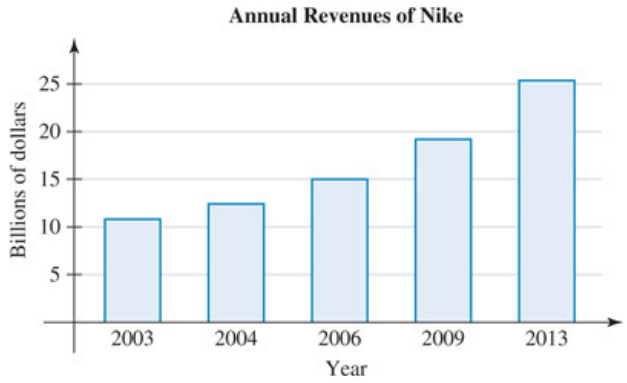

Figure 131

a. Explain why the bar graph is misleading.

b. Construct a time-series plot of the data. Use a graphing square. Explain why this graph is not misleading.

c. If someone does not look carefully, which graph makes it seem like the annual revenue is increasing by greater and greater amounts, the bar graph or the time-series plot? Explain.

d. Estimate the revenue in 2013.

e. Estimate how much the annual revenue increased from 2003 to 2013. If it increased by the same amount from 2013 to 2023, what would the annual revenue be in 2023? Do you have much faith that this prediction will turn out to be true? Explain.

6. The top five countries in wine consumption and their consumptions (in millions of gallons) are described by the three-dimensional graph in Figure 133.

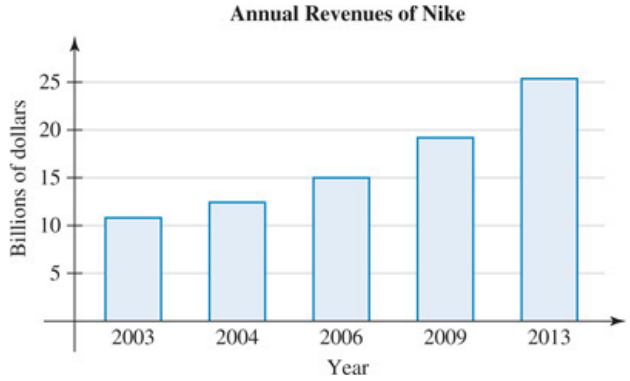

Figure 133

Table 52 Countries' Populations and Wine Consumptions in 2013

Country	Population (millions)	Wine Consumption (millions of gallons)
United States	316	770
France	66	745
Italy	61	576
Germany	81	536
China	1350	444

a. What is confusing about the three-dimensional graph?

b. The correct wine consumptions are given in Table 52. What type of graph could describe the percentages in a straightforward way? Construct such a graph.

c. Although the United States' wine consumption was greater than France's, the United States' population is much greater than France's. Calculate the wine consumption *per person* for the United States and for France. Which country has the larger consumption per person?

d. Find the wine consumption per person for Italy, Germany, and China. Of the five countries listed in Table 52, which country has the largest wine consumption per person? The least?