

Applications

Solve Exercises 1–4, and then show how you found your answer.

1. What is 5% of 40?
2. What is 22% of 220?
3. 5 is what percent of 40?
4. 75 is what percent of 80?

5. **Multiple Choice** What is 75% of 80?

A. 20 B. 40 C. 60 D. 75

6. **Multiple Choice** 22 is what percent of 220?

F. 10% G. 22% H. 44% J. 198%

7. A music store reported 15 sales for every 100 people who visited the store last year. What percent of the visitors bought something?
8. As part of a probability activity, Roberto is counting the occurrence of different letters in a paragraph in his biology book. In the first 1,000 letters, he finds 50 b's. What percent of the letters are b's?
9. Estimate what percent discount Ling will receive if she buys the microscope kit advertised below. Explain.

**MICROSCOPE
KITS**



Customers usually pay..... \$7.95
Students save by
paying only..... **\$6.76**



Go Online
PHSchool.com
For: Multiple-Choice Skills
Practice
Web Code: ama-6554

- 10.** The auto shop class conducted a survey to determine which math teacher's car was the most popular with the students. These were the results:

- a.** What percent of the votes did Mr. Alberto's car receive? Explain.
- b.** What percent of the votes did Ms. Dole's car receive?
- c.** One student said Ms. Grant's car received 48% of the votes. Is he correct? Explain.

Math Teacher	Student Votes
Ms. Grant	48
Ms. Dole	35
Mr. Alberto	12
Ms. Bock	75

- 11.** Juan, Makayla, and Sam belong to an after-school group. They joined the group at different times after the beginning of school. The chart shows their attendance so far at the various events, including meetings, held by the group.

Attendance Since Joining Group

Member	Events Attended	Total Events Held
Juan	20	30
Makayla	11	18
Sam	7	12

- a.** Suppose the attendance pattern of all three students remains about the same for the next 30 events. Who will have the highest percent of attendance at the 30 events? Explain.
 - b.** There are 120 events planned for the rest of the year. How many would you expect each of the students to attend if they keep the same percent of attendance? Explain.
- 12.** Three children put their money together to buy their parents a present. Together they have \$91. If the state sales tax is 4%, what is the maximum amount of money they can spend on the gift?
- 13.** You and your friends are going out to eat. You decide to pool your money and order several dishes and appetizers to share. You have \$75 altogether. If the tax is 5% and you want to leave a 15% tip (on the price before tax), what is the maximum you can spend?

- 14.** Violeta is shopping. She has a coupon for 20% off her total purchase. The tax is 5%.
- Violeta has \$60 to spend. How much of this can she use (after the discount is figured) and still have enough to pay the tax?
 - Violeta realizes that she has extra money to pay the tax and can spend the entire \$60 on merchandise. Use the original cost of the merchandise before the 20% is taken off. How much can the total amount to? Explain.
- 15. a.** Dog and cat owners were asked, “How often do you feed your pet?” Make two circle graphs of the results shown in the table.

Feeding Times for Pets

Time of Day	Cat Owners	Dog Owners
Night only	4%	2%
Morning only	6%	10%
Morning and night	42%	46%
Anytime	48%	42%
Total	100%	100%



- Compare the feeding patterns of dog owners to cat owners.
- Suppose the radius of each circle graph is 6 cm. Find the area of the “Morning only” section of each circle graph.

Connections

- 16.** In a survey of 100 dog owners about their pets’ habits, 39% said that their dogs eat bugs. How many dog owners surveyed said this?
- 17.** In a survey of 80 students, 40% said they had a savings account of their own. How many students surveyed said this?
- 18.** Suppose 300 tarantula owners were surveyed, and 26% said they let their spiders crawl on them. How many tarantula owners surveyed said this?



- 19.** In a survey of 80 student artists, 6% said they had sold at least one of their works of art. How many students surveyed said this?
- 20.** It is Crazy Coupon Day at the school store. At each counter students are given a coupon to use on any item at that counter. For each of the following items, compute the percent of discount.
- \$5.00 off a \$25 item
 - \$2.50 off a \$20 item
 - \$8.00 off a \$160 item
 - If you know the discount and the price, how do you find the percent discount that the coupon gives?

- 21.** A sugarless gum company used to state:

“Nine out of ten dentists surveyed recommended sugarless gum for their patients who chew gum.”

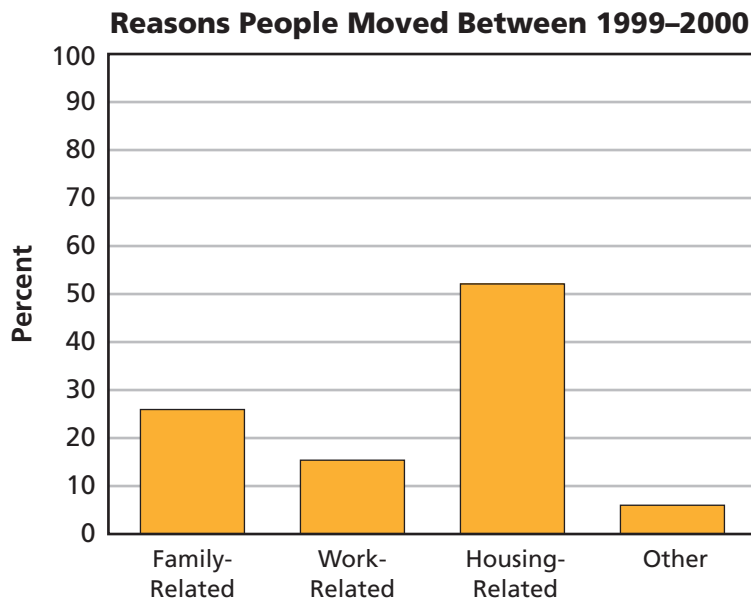
Sketch a circle graph showing the percent of dentists who recommended sugarless gum for their patients who chewed gum and the percent of dentists who did not.



For: Help with Exercise 21

Web Code: ame-6521

- 22.** The chart below shows the percent of various reasons for moving.



SOURCE: U.S. Census Bureau, Current Population Survey, March 2000



- Sketch a circle graph of the data in the chart and label each section.
- Which representation of the data would you use to argue that most people surveyed moved for housing-related reasons? Explain.

Extensions

For Exercises 23–28, find numbers that make each sentence true.

$$\begin{array}{lll} 23. \frac{6}{\square} = \frac{18}{\square} = \frac{\square}{20} & 24. \frac{12}{\square} = \frac{\square}{36} = \frac{\square}{12} & 25. \frac{\square}{8} = \frac{16}{\square} = \frac{\square}{4} \\ 26. \frac{2}{3} < \frac{\square}{9} & 27. \frac{2}{3} = \frac{\square}{9} & 28. \frac{2}{3} > \frac{\square}{9} \end{array}$$

29. 80 is 40% of what number? Explain.

30. 220 is 20% of what number? Explain.

31. When people are allowed to choose more than one answer to a survey question, the percents for the categories may add to more than 100%. For example, in one survey people were asked why they owned a pet. They were allowed to mark off more than one reason, so the percents add to more than 100%. Here are the results.

Reasons People Give for Owning Pets

Reason	Dog Owners	Cat Owners
Love/Companionship	88%	93%
Security	39%	0%
Protection	35%	0%
Entertainment	26%	33%
Catching Rodents	0%	16%
Breeding (to make money)	16%	6%
Children Grown/Spouse Died	4%	10%
Total	208%	158%

When percents add to more than 100%, you can make a bar graph to show the information.

- Make bar graphs to display the data shown in the table. Before you make your bar graphs, think about these questions:
 - What kinds of data will you display in your graphs?
 - What will you show on the horizontal axis (the x -axis)?
 - What will you show on the vertical axis (the y -axis)?
 - What scale will you use for the y -axis?
- Write a paragraph comparing the responses of dog owners to cat owners in this survey.

- 32.** Copy machines use percents to enlarge and reduce the size of copies.
- a.** The picture below has been enlarged to 200% with a copy machine. Suppose you want to return this enlarged copy to its original size. What percent should you enter on the copy machine?



- b.** Suppose you have a copy that is reduced to 50% of its original size. In order to return it to its original size, what percent should you enter into the copy machine?
- c.** A copy is $1\frac{1}{2}$ times the size of the original. What percent should you enter in a copy machine to return it to its original size?
- d.** A copy is $\frac{3}{4}$ of its original size. What percent should you enter in a copy machine to return it to its original size?