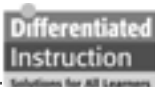


# Investigation 5

## ACE

### Assignment Choices



#### Problem 5.1

Core 1–6, 17

Other *Connections* 16, 18, *Extensions* 23–30

#### Problem 5.2

Core 7, 19

Other *Applications* 8–14, *Connections* 20; *Extensions* 32; unassigned choices from previous problems

#### Problem 5.3

Core 15

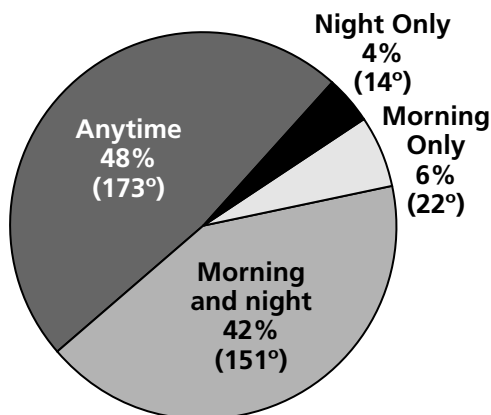
Other *Connections* 21, 22, *Extensions* 31; unassigned choices from previous problems

**Adapted** For suggestions about adapting Exercise 13 and other ACE exercises, see the *CMP Special Needs Handbook*.

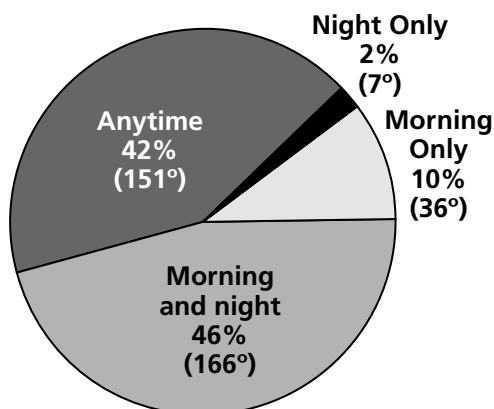
## Applications

1. 2; Possible explanation: 10% of 40 is 4, so 5% must be 2.
2. 48.4; 1% of 220 is 2.2, so 22% is  $22 \times 1\% = 22 \times 2.2 = 48.4$ .
3. 12.5%; 5 out of 40 is  $\frac{5}{40} = \frac{1}{8} = 0.125$ , or 12.5%.
4. 93.75%; 75 out of 80 is  $\frac{75}{80} = \frac{15}{16} = 0.9375$ , or 93.75%.
5. C
6. F
7. 15%
8. 5%
9. About 15%; the discount is \$1.19 out of \$7.95, or  $\frac{119}{795}$ , which gives 0.14969 on a calculator, or about 15%.
10. a. About 7%; of the 170 votes cast, 12 were for Mr. Alberto's car, and  $\frac{12}{170}$  gives 0.070588 on a calculator, or about 7%.  
b. About 21%; Ms. Dole's car received 35 out of 170 votes, or  $\frac{35}{170}$ , which gives 0.20588 on a calculator, or about 21%.  
c. No; Ms. Grant's car received 48 votes, but this can't be 48% of the votes because the number of students who voted was not 100.
11. a. Juan; Juan's percent of attendance is about 67%, Makayla's is about 61%, and Sam's is about 58%.  
b. Juan:  $0.67 \times 120 \approx 80$ ; Makayla:  $0.61 \times 120 \approx 73$ ; Sam:  $0.58 \times 120 \approx 70$
12. \$87.50
13. \$62.50
14. a. \$57.14; \$71.42 is the original price, so \$57.14 is the price she would pay out of her \$60 after the 20% discount to still allow enough money to pay tax.  
b. If tax is not an issue, then she only needs to pay 80% of the marked price of her items. We want to know what number 60 is 80% of. This is \$75.00.

15. a. When Cat Owners Feed Their Pets



When Dog Owners Feed Their Pets



- b. Possible answers: More dog owners than cat owners have set feeding times for their pets. Dog and cat feeding times are very similar.
- c. Cat owners: about  $6.8 \text{ cm}^2$   
 $(3.14 \times 36 \times 0.06 = 6.8)$ ;  
 dog owners: about  $11.3 \text{ cm}^2$   
 $(3.14 \times 36 \times 0.1 = 11.3)$

## Connections

16. 39 dog owners

17. 32 students

18. 78 tarantula owners

19. about 5 students

20. a. 20%    b. 12.5%    c. 5%

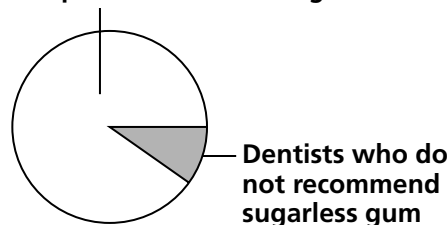
- d. Since you multiply the item price by the percent to find the amount off, you do the reverse to find the percent. You divide the price into the discount to find the percent

off. In words and fact families the problem looks like this:

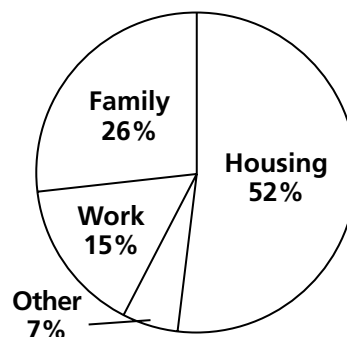
Percent off  $\times$  cost = discount, or

Percent off = discount  $\div$  cost.

21. Dentists who recommend sugarless gum for their patients who chew gum



22. a.



- b. Answers will vary. Some may find it easier to show with the circle graph, as the sector for housing is more than half the circle graph and, thus, is more than all of the other sectors combined.

## Extensions

23. Possible answer:  $\frac{6}{40} = \frac{18}{120} = \frac{3}{20}$

24. Possible answer:  $\frac{12}{24} = \frac{18}{36} = \frac{6}{12}$

25. Possible answer:  $\frac{2}{8} = \frac{16}{64} = \frac{1}{4}$

26. Possible answer:  $\frac{2}{3} < \frac{\square}{9}$  (The black box can be replaced with any number greater than 6.)

27.  $\frac{2}{3} = \frac{6}{9}$

28. Possible answer:  $\frac{2}{3} > \frac{\square}{9}$  (The black box can be replaced with any number less than 6.)

29. 200; if 40% is 80, then 10% must be 20, and 100% must be  $20 \times 10 = 200$ .

30. 1,100; if 20% is 220, then 10% must be 110, and 100% must be  $110 \times 10 = 1,100$ .

31. a. (Figure 4)

b. Possible answer: The majority of people responded that they have pets for love and companionship. The responses seem to indicate that cats are not as popular for security and protection as dogs are, but that dogs are not as good at catching rodents as are cats. Entertainment as a response was stated for both dogs and cats.

32. a. 50%                      b. 200%  
c. 67%                      d. 133%

## Possible Answers to Mathematical Reflections

- Using the fraction method of finding what percent 30 is of 120, you could reason as follows: 30 out of 120 can be expressed as  $\frac{30}{120} = \frac{1}{4} = \frac{25}{100}$ , which is 25%. Alternatively, we can change the fraction  $\frac{30}{120}$  to a decimal by dividing the numerator by the denominator, giving  $30 \div 120 = 0.25$ , which is the same as 25%.
- If the amount is \$25 and the discount was 15%, the equation to solve is  $C - 0.15C = \$25$ .

This is the same equation as  $0.85C = \$25$ .

Compute  $25 \div 0.85$  to get an original cost of \$29.41.

- Suppose that you have \$100 and that the sales tax is 7%. So the \$100 has to represent 107% of the cost of the item. You can divide \$100 by 1.07 to find the amount you can spend, about \$93.45. To check, you can take 7% of 93.45 and add it to 93.45 and see if you are near \$100.
- Because there are  $360^\circ$  in a circle, for whatever percent you need to find, say, 23% of  $360^\circ$ , rewrite 23% as the fraction  $\frac{23}{100}$  and then find an equivalent fraction with a denominator of 360. Multiply by  $\frac{3.6}{3.6}$  to make the denominator 360, and the numerator becomes  $82.8^\circ$ . Mark off a section of the circle with a central angle measure of  $82.8^\circ$ .

## Looking Back and Looking Ahead

- a. McNair's Passer Rating: 100.4

Step-by-step solution:

step 1 = 1.625;    step 2 = 1.259;  
step 3 = 1.200;    step 4 = 1.938;  
step 5 = 100.4

Manning's Passer Rating: 99.0

Figure 4

