Applications

1. The Easy Baking Company makes muffins. Some are small and some are huge. There are 20 cups of flour in the packages of flour they buy. How many muffins can be made from a package of flour if each takes the following amounts of flour?

   a. $\frac{1}{4}$ cup   **b.** $\frac{2}{4}$ cup   **c.** $\frac{3}{4}$ cup

   d. $\frac{1}{10}$ cup   **e.** $\frac{2}{10}$ cup   **f.** $\frac{7}{10}$ cup

   g. $\frac{1}{7}$ cup   **h.** $\frac{2}{7}$ cup   **i.** $\frac{6}{7}$ cup

   j. Explain how the answers for $20 \div \frac{1}{7}$, $20 \div \frac{2}{7}$, and $20 \div \frac{6}{7}$ are related. Show why this makes sense.

2. Find each quotient.

   a. $6 \div \frac{3}{5}$ **b.** $5 \div \frac{2}{9}$ **c.** $3 \div \frac{1}{4}$ **d.** $4 \div \frac{5}{8}$

3. For parts (a)–(c), do the following steps:

   • Draw pictures or write number sentences to show why your answer is correct.

   • If there is a remainder, tell what the remainder means for the situation.

   a. Bill is making 22 small pizzas for a party. He has 16 cups of flour. Each pizza crust takes $\frac{3}{4}$ cup of flour. Does he have enough flour?

   b. There are 12 baby rabbits at the pet store. The manager lets Gabriella feed vegetables to the rabbits as treats. She has $5\frac{1}{4}$ ounces of parsley today. She wants to give each rabbit the same amount. How much parsley does each rabbit get?

   c. It takes $18\frac{3}{8}$ inches of wood to make a frame for a small snapshot. Ms. Jones has 3 yards of wood. How many frames can she make?
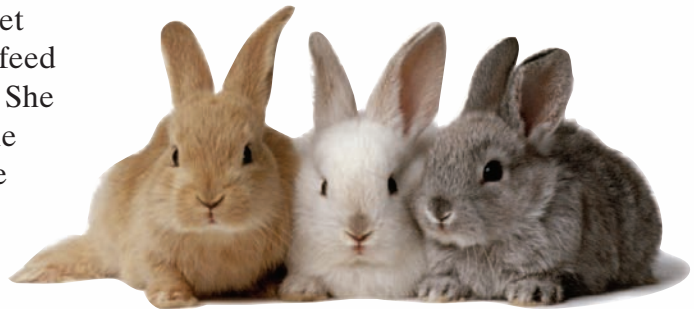
4. Find each quotient. Describe any patterns that you see.

    a. $5 \div \frac{1}{4}$ **b.** $5 \div \frac{1}{8}$ **c.** $5 \div \frac{1}{16}$

5. Maria uses $5\frac{1}{3}$ gallons of gas to drive to work and back four times.

    a. How many gallons of gas does Maria use in one round trip to work?

   **b.** Maria's car gets 28 miles to the gallon. How many miles is her round trip to work?

6. Anoki is in charge of giving prizes to teams at a mathematics competition. With each prize, he also wants to give each member of the team an equal amount of mints. How much will each team member get if Anoki has the given amounts of mints?

    a. $\frac{1}{2}$ pound of mints for 8 students

    b. $\frac{1}{4}$ pound of mints for 4 students

    c. $\frac{3}{4}$ pound of mints for 3 students

    d. $\frac{4}{5}$ pound of mints for 10 students

    e. $1\frac{1}{2}$ pounds of mints for 2 students

**7.** **Multiple Choice** Nana's recipe for applesauce makes $8\frac{1}{2}$ cups. She serves the applesauce equally among her three grandchildren. How many cups of applesauce will each one get?

    A. $\frac{3}{2}$ cups   **B.** $25\frac{1}{2}$ cups   **C.** $\frac{9}{6}$ cups   **D.** Not here

8. Divide. Draw a picture to prove that each quotient makes sense.

    a. $\frac{4}{5} \div 3$ **b.** $1\frac{2}{3} \div 5$ **c.** $\frac{5}{3} \div 5$

9. **Multiple Choice** Which of the following diagrams represents $4 \div \frac{1}{3}$?
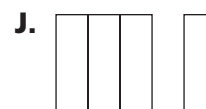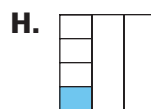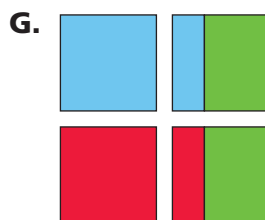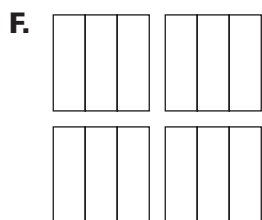
10. **Multiple Choice** Which of the following diagrams represents $\frac{1}{3} \div 4$?

A.

B.

C.

D.
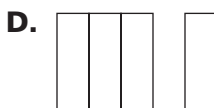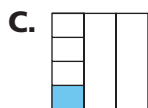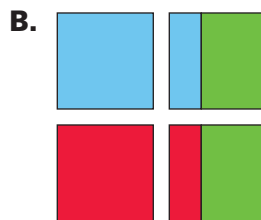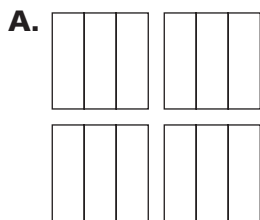
11. A latte (LAH tay) is the most popular coffee drink at Antonio's Coffee Shop.

Antonio makes only one size latte, and he uses $\frac{1}{3}$ cup of milk to make each drink. For parts (a)–(c), find:

● How many lattes he can make with the amount of milk given.

● What the remainder means, if there is one.

   a. $\frac{7}{9}$ cup   **b.** $\frac{5}{6}$ cup   **c.** $3\frac{2}{3}$ cups

12. Write a story problem that can be solved using $1\frac{3}{4} \div \frac{1}{2}$. Explain why the calculation matches your story.

13. Find each quotient.

   a. $\frac{5}{6} \div \frac{1}{3}$ **b.** $\frac{2}{3} \div \frac{1}{9}$ **c.** $1\frac{1}{2} \div \frac{3}{8}$

14. Is each quotient greater than or less than 1? Explain.

a. $\frac{7}{9} \div \frac{1}{9}$ **b.** $\frac{2}{3} \div \frac{1}{9}$ **c.** $\frac{1}{18} \div \frac{1}{9}$ **d.** $1 \div \frac{1}{9}$

For Exercises 15–20, find the quotient.

15. $10 \div \frac{2}{3}$ **16.** $5 \div \frac{3}{4}$ **17.** $\frac{6}{7} \div 4$

18. $\frac{3}{10} \div 2$ **19.** $\frac{2}{5} \div \frac{1}{3}$ **20.** $2\frac{1}{2} \div 1\frac{1}{3}$

21. For Exercises 15 and 17 above, write a story problem to fit the computation.

Write a complete multiplication-division fact family.

22. $\frac{2}{3} \times \frac{5}{7} = \frac{10}{21}$ **23.** $\frac{3}{4} \div 1\frac{1}{2} = \frac{1}{2}$

Connections

24. Mr. Delgado jogs $2\frac{2}{5}$ km on a trail and then sits down to wait for his friend Mr. Prem. Mr. Prem has jogged $1\frac{1}{2}$ km down the trail. How much farther will Mr. Prem have to jog to reach Mr. Delgado?

25. Toshi has to work at the car wash for 3 hours. So far, he has worked $1\frac{3}{4}$ hours. How many more hours before he can leave work?

For Exercises 26–29, find each sum or difference. Then, give another fraction that is equivalent to the answer.

26. $\frac{9}{10} + \frac{1}{5}$ **27.** $\frac{5}{6} + \frac{7}{8}$ **28.** $\frac{2}{3} + 1\frac{1}{3}$ **29.** $12\frac{5}{6} - 8\frac{1}{4}$

30. Every fraction can be written in many equivalent forms. For example, $\frac{12}{15}$ is equivalent to $\frac{24}{30}$. For each fraction, find two equivalent fractions. One fraction should have a numerator greater than the one given. The other fraction should have a numerator less than the one given.

     a. $\frac{4}{6}$ **b.** $\frac{10}{12}$ **c.** $\frac{12}{9}$ **d.** $\frac{8}{6}$

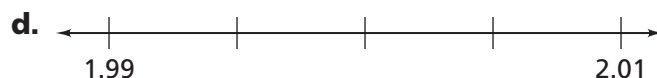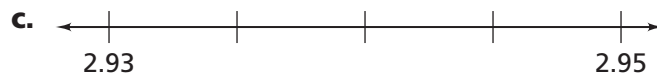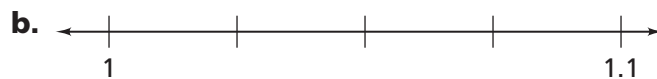**Find each product.**

31. $\frac{2}{7} \times \frac{1}{3}$ **32.** $\frac{3}{4} \times \frac{7}{8}$ **33.** $1\frac{1}{2} \times \frac{1}{3}$ **34.** $4\frac{2}{3} \times 2\frac{3}{4}$

35. The marks on each number line are spaced so that the distance between two consecutive marks is the same. Copy each number line and label the marks.

     a.

1.8   2

     b.

1   1.1

     c.

2.93   2.95

     d.

1.99   2.01

     e. Explain how you determined what the labels should be.

36. By what number should you multiply to get 1 as the product?

     a. $2 \times \blacksquare = 1$ **b.** $\frac{1}{2} \times \blacksquare = 1$ **c.** $3 \times \blacksquare = 1$

     d. $\frac{1}{3} \times \blacksquare = 1$ **e.** $\blacksquare \times \frac{2}{3} = 1$ **f.** $\frac{3}{4} \times \blacksquare = 1$

     g. $\blacksquare \times \frac{5}{2} = 1$ **h.** $1\frac{1}{4} \times \blacksquare = 1$ **i.** $\frac{7}{12} \times \blacksquare = 1$

37. Find the missing numbers in each pair. What is the relationship between each pair?

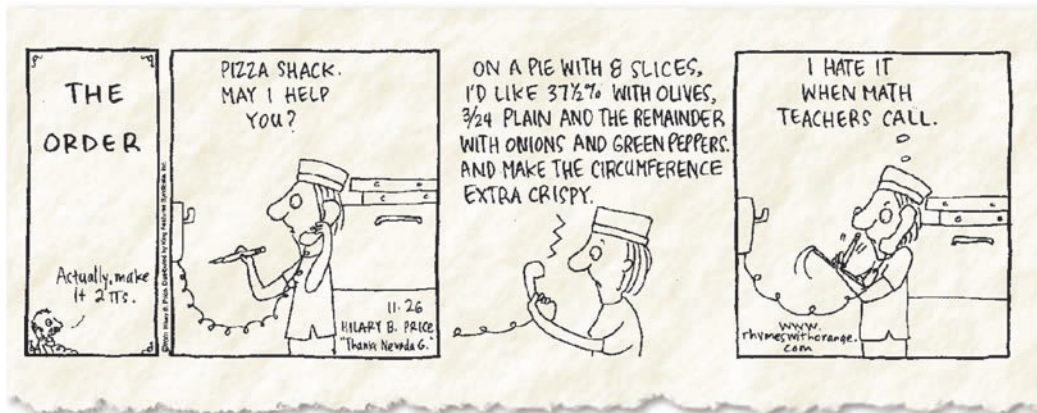**a.** $3 \div \blacksquare = 9$

$3 \times \blacksquare = 9$

b. $3 \div \blacksquare = 12$

$3 \times \blacksquare = 12$

c. $2\frac{1}{2} \div \blacksquare = 5$

$2\frac{1}{2} \times \blacksquare = 5$

38. Use the cartoon to answer the questions below.

a. How many slices of the pizza will have olives?

b. How many slices of the pizza will be plain?

c. What fraction of the pizza will have onions and green peppers?

Extensions

39. DonTae says that when you want to find out how many quarters are in some whole number of dollars, you should divide the number of dollars by $\frac{1}{4}$. Vanna says that you need to multiply the number of dollars by 4. With whom do you agree? Why?

40. Find a value for N that makes the sentence true. Don't forget fact families.

a. $N \times \frac{1}{5} = \frac{2}{15}$

b. $N \div \frac{1}{5} = \frac{2}{3}$

c. $\frac{1}{2} \times N = \frac{1}{3}$

d. $\frac{1}{5} \div N = \frac{1}{3}$

e. $1\frac{3}{4} \div N = \frac{1}{4}$

f. $2\frac{2}{3} \div N = 8$

41. Use the table below to solve parts (a)–(e).

Measurement	Equivalent Measurement
1 cup	16 tablespoons
1 quart	4 cups
1 quart	2 pints
1 gallon	4 quarts
1 tablespoon	3 teaspoons

a. Brian is missing his measuring cup. He needs to measure out $\frac{1}{2}$ cup of vegetable oil. How many tablespoons should he use?

b. How many teaspoons does Brian need to use to measure out $\frac{1}{2}$ cup of vegetable oil?

c. What fraction of a quart is $\frac{1}{2}$ cup?

d. What fraction of a gallon is $\frac{1}{2}$ cup?

e. Suppose you need to measure out exactly one gallon of water. The only measuring cups you have are $\frac{1}{2}$ cup, 1 cup, and 1 pint. Which measuring cup would you use? How would you make sure you had exactly one gallon?