

Name: School: Grade: Class:

5-7 Multiplying Fractions - Practice and Problem Solving

Multiply. Write in simplest form.

9. $\frac{1}{3} \times \frac{2}{5}$

$$\begin{aligned}\frac{1}{3} \times \frac{2}{5} &= \frac{1 \times 2}{3 \times 5} \\ &= \frac{2}{15}\end{aligned}$$

11. $\frac{3}{4} \times \frac{5}{8}$

$$\begin{aligned}\frac{3}{4} \times \frac{5}{8} &= \frac{3 \times 5}{4 \times 8} \\ &= \frac{15}{32}\end{aligned}$$

13. $\frac{3}{4} \times 2$

$$\begin{aligned}\frac{3}{4} \times 2 &= \frac{3}{4} \times \frac{2}{1} \\ &= \frac{3 \times \overset{1}{\cancel{2}}}{\underset{2}{\cancel{4}} \times 1} \\ &= \frac{3}{2} \text{ or } 1\frac{1}{2}\end{aligned}$$

15. $\frac{5}{6} \times 15$

$$\begin{aligned}\frac{5}{6} \times 15 &= \frac{5}{6} \times \frac{15}{1} \\ &= \frac{5 \times \overset{5}{\cancel{15}}}{\underset{2}{\cancel{6}} \times 1} \\ &= \frac{25}{2} \text{ or } 12\frac{1}{2}\end{aligned}$$

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17. $\frac{2}{3} \times \frac{1}{4}$

$$\begin{aligned}\frac{2}{3} \times \frac{1}{4} &= \frac{\overset{1}{\cancel{2}} \times 1}{3 \times \underset{2}{\cancel{4}}} \\ &= \frac{1}{6}\end{aligned}$$

19. $\frac{4}{9} \times \frac{3}{8}$

$$\begin{aligned}\frac{4}{9} \times \frac{3}{8} &= \frac{\overset{1}{\cancel{4}} \times \overset{1}{\cancel{3}}}{\underset{3}{\cancel{9}} \times \underset{2}{\cancel{8}}} \\ &= \frac{1}{6}\end{aligned}$$

ALGEBRA Evaluate each expression if $a = \frac{3}{5}$, $b = \frac{1}{2}$, and $c = \frac{1}{3}$.

21. ab

$$\begin{aligned}ab &= \frac{3}{5} \times \frac{1}{2} \\ &= \frac{3 \times 1}{5 \times 2} \\ &= \frac{3}{10}\end{aligned}$$

23. $\frac{1}{3}a$

$$\begin{aligned}\frac{1}{3}a &= \frac{1}{3} \times \frac{3}{5} \\ &= \frac{1 \times \overset{1}{\cancel{3}}}{\underset{1}{\cancel{3}} \times 5} \\ &= \frac{1}{5}\end{aligned}$$

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25. **ANIMALS** A sloth spends about $\frac{4}{5}$ of its life asleep. If a sloth lives to be 28 years old, how many years did it spend asleep?

$$\begin{aligned}\frac{4}{5} \times 28 &= \frac{4}{5} \times \frac{28}{1} \\ &= \frac{4 \times 28}{5 \times 1} \\ &= \frac{112}{5} \\ &= 22\frac{2}{5}\end{aligned}$$

A sloth sleeps $22\frac{2}{5}$ years.

27. **WEATHER** In a recent year, the weather was partly cloudy $\frac{2}{5}$ of the days. Assuming there are 365 days in a year, how many days were partly cloudy?

$$\begin{aligned}\frac{2}{5} \times 365 &\rightarrow \frac{2}{5} \times \frac{365}{1} \\ &= \frac{2 \times \overset{73}{\cancel{365}}}{\underset{1}{\cancel{5}}} \\ &= 146\end{aligned}$$

146 days were partly cloudy.

29. $\frac{1}{2} \times \frac{1}{3} \times \frac{1}{4}$

$$\begin{aligned}\frac{1}{2} \times \frac{1}{3} \times \frac{1}{4} &= \frac{1 \times 1 \times 1}{2 \times 3 \times 4} \\ &= \frac{1}{24}\end{aligned}$$

31. $\frac{1}{2} \times \frac{2}{5} \times \frac{15}{16}$

$$\begin{aligned}\frac{1}{2} \times \frac{2}{5} \times \frac{15}{16} &= \frac{1 \times 2 \times 15}{2 \times 5 \times 16} \\ &= \frac{30}{160} \text{ or } \frac{3}{16}\end{aligned}$$

ALGEBRA Evaluate each expression if $x = \frac{4}{5}$, $y = \frac{3}{7}$, and $z = \frac{7}{10}$.

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33. $\frac{2}{3}xz$

$$\begin{aligned}\frac{2}{3}xz &= \frac{2}{3} \times \frac{4}{5} \times \frac{7}{10} \\ &= \frac{\overset{1}{2} \times 4 \times 7}{3 \times 5 \times \underset{5}{10}} \\ &= \frac{28}{75}\end{aligned}$$

35. $\frac{3}{4}x + z$

$$\begin{aligned}\frac{3}{4}x + z &= \frac{3}{4} \times \frac{4}{5} + \frac{7}{10} \\ &= \frac{3}{5} + \frac{7}{10} \\ &= \frac{6}{10} + \frac{7}{10} \\ &= \frac{6+7}{10} \\ &= \frac{13}{10} \text{ or } 1\frac{3}{10}\end{aligned}$$

37. **GEOGRAPHY** Michigan's area is 96,810 square miles. Water makes up about $\frac{2}{5}$ of the area of the state. About how many square miles of water does Michigan have?



96,810 is approximately 100,000.

$$\frac{2}{5} \times \frac{100,000}{1} = 40,000$$

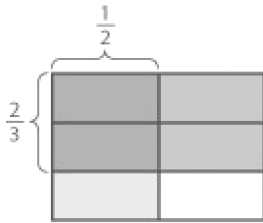
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39. **FRANCE** In a poll of the students in Lily's French class, $\frac{1}{6}$ have been to France. Of these, 4 have been to Paris. Would 18, 26, or 30 be a reasonable number of students in Lily's French class? Explain your reasoning.

30; Sample answer: $\frac{1}{6}$ of 26 is not a whole number and $\frac{1}{6}$ of 18 is 3. If only 3 students have been to France, it is impossible that 4 students have been to Paris.

41. **OPEN ENDED** Create a model to explain why $\frac{2}{3} \times \frac{1}{2} = \frac{1}{3}$.

The overlapping shaded area is $\frac{2}{6}$ or $\frac{1}{3}$ of the whole.



REASONING State whether each statement is *true* or *false*. If the statement is *false*, provide a counterexample.

43. The product of a mixed number between 4 and 5 and a fraction between 0 and 1 is less than 4.

false; $4\frac{9}{10} \times \frac{9}{10} = 4\frac{41}{100}$

45. **NUMBER SENSE** If a product of two positive fractions, a and b , is $\frac{15}{56}$, find three pairs of possible values for a and b .

Sample answer:

$$a = \frac{3}{8} \text{ and } b = \frac{5}{7};$$

$$a = \frac{5}{8} \text{ and } b = \frac{3}{7};$$

$$a = \frac{5}{14} \text{ and } b = \frac{3}{4}$$

47. **WRITING IN MATH** Explain why $\frac{a}{b} \times \frac{b}{c} \times \frac{c}{d} \times \frac{d}{e}$ is equal to $\frac{a}{e}$.

The fraction $\frac{a}{b} \times \frac{b}{c} \times \frac{c}{d} \times \frac{d}{e}$ can be simplified before multiplying by crossing out the factors that appear in both a numerator and a denominator. The factors that can be crossed out are b , c , and d .

Thus, the only factors remaining are a in a numerator and e in a denominator, or $\frac{a}{e}$.

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49. There are 150 students in the band and 90 students in the chorus. One-half of the band members and $\frac{4}{5}$ of the chorus members participated in a charity concert. How many more band members than chorus members participated in the concert?

F 3
G 18
H 27
J 72

$$\begin{aligned}\frac{1}{2} \times 150 - \frac{4}{5} \times 90 \\ = 75 - 72 \\ = 3\end{aligned}$$

The answer is F.

Estimate each product.

51. $1\frac{8}{9} \times 5\frac{1}{6}$

Sample answer: $2 \times 5 = 10$

53. $\frac{4}{9} \times \frac{8}{9}$

Sample answer: $\frac{1}{2} \times 1 = \frac{1}{2}$

55. **MAGAZINES** Samuel receives a car magazine once every four weeks, a music magazine once every six weeks, and a movie magazine once every nine weeks. If he received all three magazines this week, in how many weeks will he receive all three magazines again?

$$\begin{aligned}4 &= 2 \times 2 \\ 6 &= 2 \times 3 \\ 9 &= 3 \times 3 \\ 2 \times 2 \times 3 \times 3 &= 36\end{aligned}$$

He will receive all three magazines again in 36 weeks.

57. **RESTAURANTS** Marcus and four friends went to dinner at a local restaurant. The total cost of each friend's bill was \$14.78, \$15.24, \$14.87, \$15.42, and \$14.75. Write these bills in order from least to greatest.

\$14.75, \$14.78, \$14.87, \$15.24, \$15.42

PREREQUISITE SKILL Write each mixed number as an improper fraction.

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59. $5\frac{2}{3}$

$$\begin{aligned} 5\frac{2}{3} &= \frac{(5 \times 3) + 2}{3} \\ &= \frac{15 + 2}{3} \\ &= \frac{17}{3} \end{aligned}$$

61. $6\frac{5}{8}$

$$\begin{aligned} 6\frac{5}{8} &= \frac{(6 \times 8) + 5}{8} \\ &= \frac{48 + 5}{8} \\ &= \frac{53}{8} \end{aligned}$$