REVIEW: Dividing Whole Numbers

Name _____

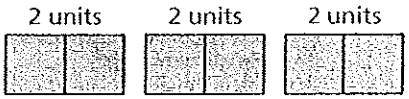
Key Concept and Vocabulary

dividend → 10 ; quotient → 5 ; divisor → 2

$10 \div 2 = 5$

Visual Model

If you divide 6 units into 3 equal parts, each part will have 2 units.



$6 \div 3 = 2$

Skill Examples

1. $42 \div 6 = 7$

2. $\frac{65}{13} = 65 \div 13 = 5$

3. $195 \div 15 = 13$

$$\begin{array}{r} 13 \\ 15\overline{)195} \\ \underline{15} \\ 45 \\ \underline{45} \\ 0 \end{array}$$

Application Example

4. Six people find a treasure worth $12,300. If each person receives an equal share, how much does each person get?

$\$12{,}300 \div 6 = \$2050$

∴ Each person gets $2050.

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Check your answers at BigIdeasMath.com.

Find the quotient.

5. $56 \div 8 =$ _____

6. $99 \div 11 =$ _____

7. $132 \div 6 =$ _____

8. $80 \div 5 =$ _____

9. $\frac{88}{4} =$ _____

10. $\frac{156}{3} =$ _____

11. $\frac{430}{86} =$ _____

12. $\frac{3082}{23} =$ _____

13. $18\overline{)216}$

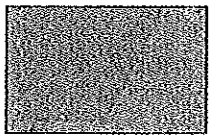
14. $12\overline{)960}$

15. $9\overline{)567}$

16. $19\overline{)323}$

Find the height of the rectangle or parallelogram.

17. ____ft



8 ft

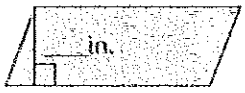
Area = 40 ft^2

18. ____cm

10 cm

Area = 120 cm^2

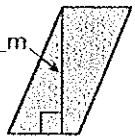
19. ____in.



21 in.

Area = 168 $in.^2$

20. ____m



9 m

Area = 144 m^2

21. **PARTY PUNCH** A punch bowl contains 6 quarts of punch. There are 32 fluid ounces in a quart. How many 4-fluid ounce cups will the punch bowl serve? _____

22. **SHARING THE PROFIT** You and three friends start a small business. Your total income is $820 and your total expenses are $360. You share the profit evenly. How much do each of you get? Explain. _____

_____

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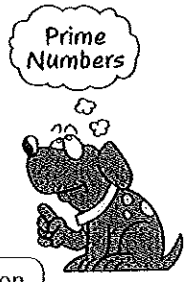
REVIEW: Prime and Composite Numbers

Name _____

Key Concept and Vocabulary

A **prime number** has only 1 and itself as factors. The first 5 prime numbers are 2, 3, 5, 7, and 11.

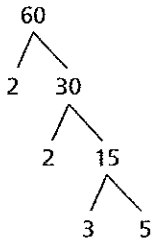


$24 = 2 \cdot 2 \cdot 2 \cdot 3$

composite — prime factorization

Visual Model

You can use a **factor tree** to find the prime factorization of a composite number.



$60 = 2 \cdot 2 \cdot 3 \cdot 5$

Skill Examples

Prime Factorization

1. $30 = 2 \cdot 3 \cdot 5$
2. $42 = 2 \cdot 3 \cdot 7$
3. $81 = 3 \cdot 3 \cdot 3 \cdot 3$
4. $91 = 7 \cdot 13$
5. $89 = 89$ (Prime)

Application Example

6. You get a paycheck every 2 weeks. Your annual salary is \$30,000. Can you get the same amount for each paycheck?

   $30{,}000 = 2 \cdot 2 \cdot 2 \cdot 2 \cdot 3 \cdot 5 \cdot 5 \cdot 5 \cdot 5$

   30,000 is not divisible by 13, so you cannot have 26 paychecks of equal size.

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Check your answers at BigIdeasMath.com.

Write the prime factorization of the number.

7. 45 = _____
8. 100 = _____
9. 63 = _____
10. 256 = _____
11. 54 = _____
12. 55 = _____
13. 121 = _____
14. 98 = _____
15. 113 = _____

16. Use a factor tree to find the prime factorization of 36.

17. **EQUAL PAYCHECKS** You get a paycheck every 2 weeks. Your annual salary is \$39,000. Can you get the same amount for each paycheck? Explain why or why not.

_____

_____

18. **LISTING PRIME NUMBERS** List all the prime numbers that are less than 50.

_____

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REVIEW: Commutative and Associative Properties

Name _____

Key Concept and Vocabulary

Commutative Property

$1 + 3 = 3 + 1$ *(Addition)*

$2 + (3 + 5) = (2 + 3) + 5$ *(Addition)*

Associative Property

Commutative Property

$2 \cdot 5 = 5 \cdot 2$ *(Multiplication)*

$2 \cdot (3 \cdot 5) = (2 \cdot 3) \cdot 5$ *(Multiplication)*

Associative Property

Skill Examples

1. $3 + 6 = 6 + 3$
2. $15 + (5 + 3) = (15 + 5) + 3$
3. $4 \cdot 6 = 6 \cdot 4$
4. $2 \cdot (3 \cdot 5) = (2 \cdot 3) \cdot 5$

Application Example

5. Use the above properties and mental math to find the sum: $97 + 28 + 3 + 2$.

$$\begin{aligned} 97 + 28 + 3 + 2 &= (97 + 3) + (28 + 2) \\ &= 100 + 30 \\ &= 130 \end{aligned}$$

$\therefore$ The sum is 130.

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Check your answers at BigIdeasMath.com.

Identify the property. Then find the sum or product.

6. $11 + 36 = 36 + 11$ _____
7. $10 \cdot 4 = 4 \cdot 10$ _____
8. $5 \cdot (4 \cdot 2) = (5 \cdot 4) \cdot 2$ _____
9. $2 + (3 + 5) = (2 + 3) + 5$ _____
10. $2 + 3 + 4 = 2 + 4 + 3$ _____
11. $5 \cdot 2 \cdot 3 = 2 \cdot 5 \cdot 3$ _____

Show how you can use the Commutative and Associative Properties to find the sum or product using mental math.

12. $34 + 47 + 16 =$ _____
13. $5 \cdot 13 \cdot 2 =$ _____
14. $15 + 13 + 27 + 35 =$ _____
15. $9 \cdot 5 \cdot 3 \cdot 2 =$ _____

16. **COMMUTATIVITY** Describe two real-life activities that are *not* commutative. In other words, you get different results if you switch the order in which the activities are performed.

_____

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REVIEW: Order of Operations

Name _____

Key Concept and Vocabulary

"Please Excuse My Dear Aunt Sally"

1st Parentheses

2nd Exponents

3rd Multiplication and Division (from left to right)

4th Addition and Subtraction (from left to right)

Simplify $4^2 \div 2 + 3(9 - 5)$.

$$\begin{aligned} 4^2 \div 2 + 3(9 - 5) &= 4^2 \div 2 + 3 \cdot 4 \\ &= 16 \div 2 + 3 \cdot 4 \\ &= 8 + 12 \\ &= 20 \end{aligned}$$

Skill Examples

1. $18 \div 2 - 4 = 9 - 4 = 5$
2. $12 \cdot (6 - 2) = 12 \cdot 4 = 48$
3. $14 \cdot 3 - 19 = 42 - 19 = 23$
4. $20 \div 10 + 21 \cdot 5 = 2 + 105 = 107$
5. $(2 + 3)^2 - 5 = 25 - 5 = 20$

Application Example

6. At a museum, 4 adults pay \$5 each and 6 children pay \$3 each. What is the total cost of the tickets?

$$\begin{aligned} 4 \cdot 5 + 6 \cdot 3 &= 20 + 18 \\ &= 38 \end{aligned}$$

The total cost is \$38.

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Check your answers at BigIdeasMath.com.

Simplify.

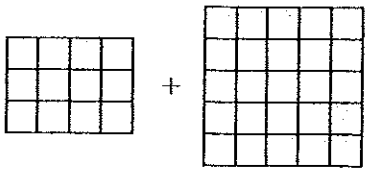
7. $3^2 + 5(4 - 2) =$ _____
8. $3 + 4 \div 2 =$ _____
9. $10 \div 5 \cdot 3 =$ _____
10. $4(3^3 - 8) \div 2 =$ _____
11. $3 \cdot 6 - 4 \div 2 =$ _____
12. $12 + 7 \cdot 3 - 24 =$ _____

Insert parentheses to make the statement true.

13. $5^2 - 15 \div 5 = 2$
14. $12 \cdot 2^3 + 4 = 144$
15. $91 - 21 \div 7 = 10$

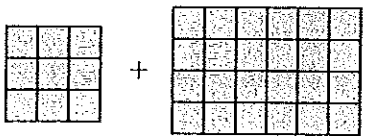
Write an expression for the total area of the two rectangles. Evaluate your expression.

16.



_____

17.



_____

18. **ADMISSION** At a baseball game, 6 adults pay \$20 each and 4 children pay \$10 each. What is the total cost of the tickets? _____

19. **INSERTING PARENTHESES** Insert parentheses in the expression $4 + 2^3 - 5 \cdot 2$ in two ways: (a) so that the value is 10 and (b) so that the value is 14.

(a) _____ (b) _____

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REVIEW: Equivalent Fractions

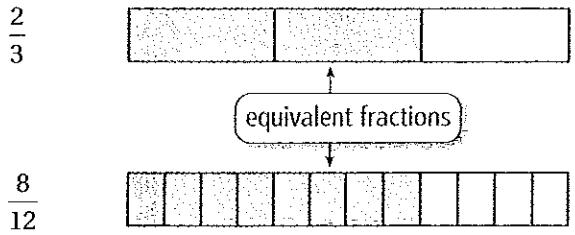
Name _____

Key Concept and Vocabulary

$$\frac{2}{3} = \frac{2 \cdot 4}{3 \cdot 4} = \frac{8}{12}$$

Multiply numerator and denominator by the same number.

Visual Model



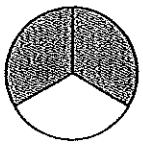
Skill Examples

1. $\frac{1}{2} = \frac{1 \cdot 2}{2 \cdot 2} = \frac{2}{4}$
2. $\frac{1}{2} = \frac{1 \cdot 3}{2 \cdot 3} = \frac{3}{6}$
3. $\frac{3}{4} = \frac{3 \cdot 5}{4 \cdot 5} = \frac{15}{20}$
4. $\frac{4}{5} = \frac{4 \cdot 20}{5 \cdot 20} = \frac{80}{100}$

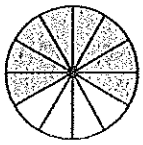
$\frac{1}{2}$, $\frac{2}{4}$, and $\frac{3}{6}$ are all equivalent.

Application Example

5. You eat two-thirds of a pizza that has 12 pieces. How many pieces do you eat?



$$\frac{2}{3} = \frac{2 \cdot 4}{3 \cdot 4} = \frac{8}{12}$$



∴ You eat 8 pieces.

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Check your answers at BigIdeasMath.com.

Write a fraction that is equivalent to the given fraction.

6. $\frac{1}{2} = \frac{\square}{4}$
7. $\frac{3}{5} = \frac{\square}{15}$
8. $\frac{4}{3} = \frac{\square}{9}$
9. $\frac{1}{3} = \frac{\square}{27}$
10. $\frac{2}{5} = \frac{\square}{20}$
11. $\frac{7}{8} = \frac{\square}{64}$
12. $\frac{3}{7} = \frac{6}{\square}$
13. $\frac{9}{4} = \frac{36}{\square}$
14. $\frac{1}{5} = \frac{10}{\square}$
15. $\frac{3}{9} = \frac{12}{\square}$
16. $\frac{7}{10} = \frac{14}{\square}$
17. $\frac{3}{8} = \frac{9}{\square}$

Shade the model so that the fraction is equivalent.

18.

19.

20. **PIZZA** You eat three-fourths of a pizza that has 12 pieces. How many pieces do you eat? _____

21. **SURVEY** A survey asked 240 people if they liked the movie "Star Wars." One-third liked it, one-sixth did not like it, and one-half had not seen it. How many people are in each of the three categories? _____

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REVIEW: Simplifying Fractions

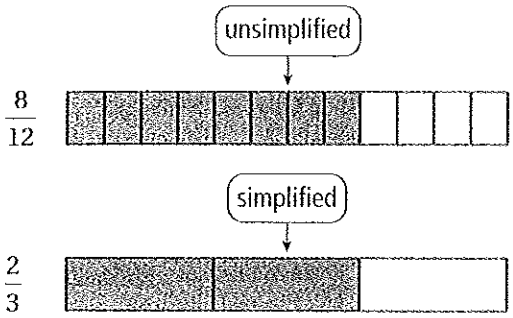
Name _____

Key Concept and Vocabulary

$$\frac{8}{12} = \frac{2 \cdot \cancel{4}}{3 \cdot \cancel{4}} = \frac{2}{3}$$

Divide numerator and denominator by common factor.

Visual Model

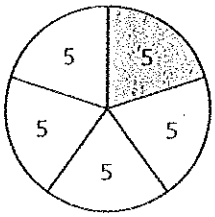


Skill Examples

1. $\frac{2}{4} = \frac{1 \cdot \cancel{2}}{2 \cdot \cancel{2}} = \frac{1}{2}$
2. $\frac{3}{6} = \frac{1 \cdot \cancel{3}}{2 \cdot \cancel{3}} = \frac{1}{2}$
3. $\frac{15}{20} = \frac{3 \cdot \cancel{5}}{4 \cdot \cancel{5}} = \frac{3}{4}$
4. $\frac{80}{100} = \frac{4 \cdot \cancel{20}}{5 \cdot \cancel{20}} = \frac{4}{5}$

Application Example

5. Five of the 25 students in your class have a Facebook account. Write this fraction in simplified form.



$$\frac{5}{25} = \frac{1 \cdot \cancel{5}}{5 \cdot \cancel{5}} = \frac{1}{5}$$

One-fifth of your class has a Facebook account.

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Check your answers at BigIdeasMath.com.

Simplify the fraction.

6. $\frac{16}{18} =$ _____
7. $\frac{10}{12} =$ _____
8. $\frac{6}{8} =$ _____
9. $\frac{15}{45} =$ _____
10. $\frac{12}{40} =$ _____
11. $\frac{14}{21} =$ _____
12. $\frac{6}{2} =$ _____
13. $\frac{20}{50} =$ _____
14. $\frac{12}{30} =$ _____
15. $\frac{20}{15} =$ _____
16. $\frac{75}{85} =$ _____
17. $\frac{21}{35} =$ _____

Shade the model so that the fraction is simplified.

18.

19.

20. **FACEBOOK** Eight of the 24 students in your class have a Facebook account. Write this fraction in simplified form. _____

21. **SIMPLIFYING** Write five different fractions that each simplify to two-fifths.

_____

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REVIEW: Comparing and Ordering Fractions

Name _____

Key Concept and Vocabulary

$2 \cdot 4 = 8$ $\quad$ $3 \cdot 3 = 9$

$\frac{2}{3} \cdot \frac{3}{4}$

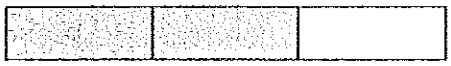
Find products.

Comparing Fractions

$\frac{2}{3} < \frac{3}{4}$ because $8 < 9$.

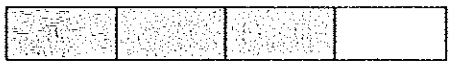
Visual Model

$\frac{2}{3}$



$\frac{2}{3} < \frac{3}{4}$

$\frac{3}{4}$



Skill Examples

1. $\frac{1}{2} > \frac{5}{11}$ because $1 \cdot 11 > 2 \cdot 5$.
2. $\frac{3}{6} = \frac{1}{2}$ because $3 \cdot 2 = 6 \cdot 1$.
3. $\frac{3}{8} < \frac{2}{5}$ because $3 \cdot 5 < 8 \cdot 2$.
4. $\frac{4}{9} > \frac{3}{7}$ because $4 \cdot 7 > 9 \cdot 3$.

Application Example

5. You run seven-eighths mile. Your friend runs eight-tenths mile. Who runs farther?

   $\frac{7}{8} > \frac{8}{10}$ because $7 \cdot 10 > 8 \cdot 8$.

   ∴ You run farther.

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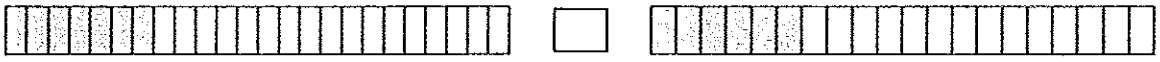
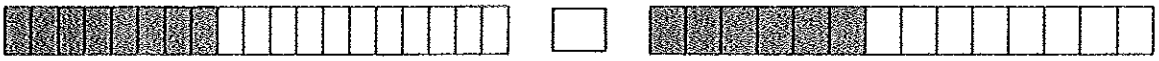
Check your answers at BigIdeasMath.com.

Compare the fractions using <, >, or =.

6. $\frac{4}{5} \square \frac{8}{11}$
7. $\frac{6}{7} \square \frac{5}{6}$
8. $\frac{6}{7} \square \frac{7}{8}$
9. $\frac{3}{11} \square \frac{6}{22}$
10. $\frac{9}{2} \square \frac{14}{3}$
11. $\frac{3}{9} \square \frac{1}{3}$
12. $\frac{4}{9} \square \frac{9}{20}$
13. $\frac{7}{12} \square \frac{4}{7}$
14. $\frac{2}{9} \square \frac{4}{18}$
15. $\frac{3}{8} \square \frac{4}{11}$
16. $\frac{7}{5} \square \frac{13}{9}$
17. $\frac{6}{5} \square \frac{11}{10}$

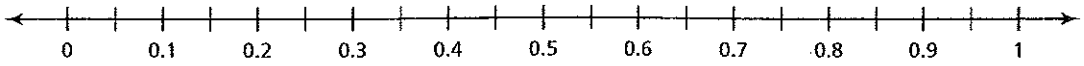
Compare the fractions models using <, >, or =.

18. 

19. 

20. **MILK** You drink six-eighths of a quart of milk. Your friend pours a quart of milk into four 8-fluid ounce glasses and drinks three of them. Who drinks more? _____

21. **ORDERING FRACTIONS** Order the fractions from least to greatest and graph them on a number line: $\frac{3}{8}, \frac{1}{4}, \frac{1}{3}$, and $\frac{2}{5}$.



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REVIEW: Adding and Subtracting Fractions with Like Denominators

Name _____

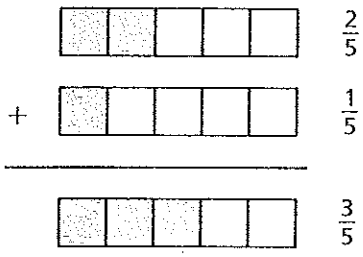
Key Concept and Vocabulary

$\frac{2}{5} + \frac{1}{5} = \frac{2+1}{5} = \frac{3}{5}$

Add or subtract numerators.

$\frac{2}{5} - \frac{1}{5} = \frac{2-1}{5} = \frac{1}{5}$

Visual Model



Skill Examples

1. $\frac{3}{8} + \frac{3}{8} = \frac{3+3}{8} = \frac{6}{8} = \frac{3}{4}$
2. $\frac{3}{4} + \frac{1}{4} = \frac{3+1}{4} = \frac{4}{4} = 1$
3. $\frac{7}{10} - \frac{4}{10} = \frac{7-4}{10} = \frac{3}{10}$
4. $\frac{13}{25} - \frac{8}{25} = \frac{13-8}{25} = \frac{5}{25} = \frac{1}{5}$

Application Example

5. On Monday, you painted two-fifths of a house. On Tuesday, you painted the same amount. How much is left?

$\frac{5}{5} - \left(\frac{2}{5} + \frac{2}{5}\right) = \frac{5}{5} - \frac{4}{5} = \frac{1}{5}$

You have one-fifth left to paint.

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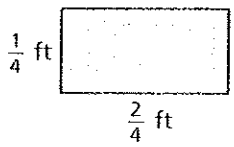
Check your answers at BigIdeasMath.com.

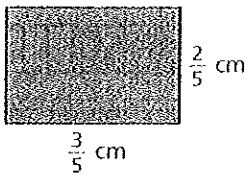
Find the sum or difference. Write your answer in simplified form.

6. $\frac{1}{9} + \frac{2}{9} =$ _____
7. $\frac{6}{11} + \frac{5}{11} =$ _____
8. $\frac{1}{10} + \frac{3}{10} =$ _____
9. $\frac{3}{4} + \frac{2}{4} =$ _____
10. $\frac{3}{8} + \frac{1}{8} =$ _____
11. $\frac{1}{5} + \frac{2}{5} + \frac{2}{5} =$ _____
12. $\frac{5}{8} - \frac{1}{8} =$ _____
13. $\frac{6}{7} - \frac{3}{7} =$ _____
14. $\frac{7}{9} - \frac{4}{9} =$ _____
15. $\frac{9}{10} - \frac{7}{10} =$ _____
16. $\frac{5}{6} - \frac{2}{6} =$ _____
17. $\frac{6}{6} - \left(\frac{1}{6} + \frac{2}{6}\right) =$ _____

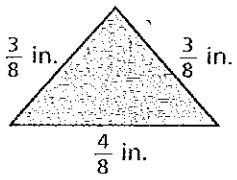
Find the perimeter of the rectangle or triangle.

18. 

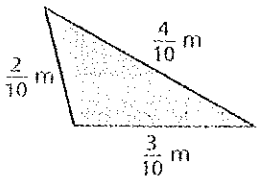
Perimeter = _____

19. 

Perimeter = _____

20. 

Perimeter = _____

21. 

Perimeter = _____

22. **REACHING YOUR GOAL** You have a savings goal. In January, you saved $\frac{2}{10}$ of your goal. In February, you saved $\frac{3}{10}$ more. How much of your goal remains? Explain.

_____

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REVIEW: Adding and Subtracting Fractions with Unlike Denominators

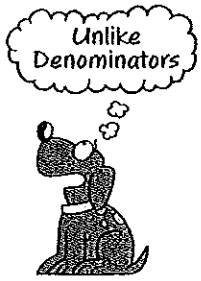
Name _____

Key Concept and Vocabulary

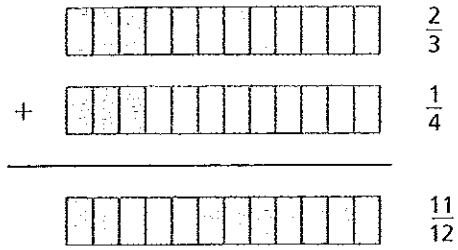
Find products.

$$\frac{2}{3} \times \frac{1}{4} = \frac{2 \cdot 4 + 3 \cdot 1}{3 \cdot 4} = \frac{11}{12}$$

$$\frac{2}{3} \times \frac{1}{4} = \frac{2 \cdot 4 - 3 \cdot 1}{3 \cdot 4} = \frac{5}{12}$$



Visual Model



Skill Examples

1. $\frac{1}{5} + \frac{2}{3} = \frac{1 \cdot 3 + 5 \cdot 2}{5 \cdot 3} = \frac{13}{15}$
2. $\frac{1}{2} + \frac{1}{4} = \frac{1 \cdot 4 + 2 \cdot 1}{2 \cdot 4} = \frac{6}{8} = \frac{3}{4}$
3. $\frac{1}{3} - \frac{1}{4} = \frac{1 \cdot 4 - 3 \cdot 1}{3 \cdot 4} = \frac{1}{12}$
4. $\frac{3}{7} - \frac{2}{5} = \frac{3 \cdot 5 - 7 \cdot 2}{7 \cdot 5} = \frac{1}{35}$

Application Example

5. You ride your bike $\frac{3}{8}$ mile to the store. Then you ride $\frac{1}{6}$ mile to school. How far do you ride altogether?

$$\frac{3}{8} + \frac{1}{6} = \frac{3 \cdot 6 + 8 \cdot 1}{8 \cdot 6} = \frac{26}{48} = \frac{13}{24}$$

∴ You ride $\frac{13}{24}$ mile.

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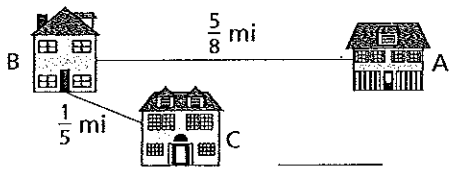
Check your answers at BigIdeasMath.com.

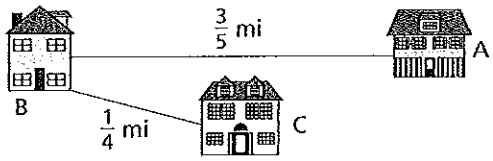
Find the sum or difference. Write your answer in simplified form.

6. $\frac{1}{3} + \frac{1}{8} =$ _____
7. $\frac{2}{3} + \frac{1}{5} =$ _____
8. $\frac{3}{10} + \frac{1}{4} =$ _____
9. $\frac{1}{2} + \frac{2}{5} =$ _____
10. $\frac{3}{7} + \frac{1}{3} =$ _____
11. $\frac{1}{8} + \frac{2}{5} =$ _____
12. $\frac{5}{8} - \frac{1}{3} =$ _____
13. $\frac{5}{6} - \frac{3}{5} =$ _____
14. $\frac{5}{9} - \frac{2}{5} =$ _____
15. $\frac{7}{10} - \frac{1}{4} =$ _____
16. $\frac{3}{5} - \frac{1}{6} =$ _____
17. $\frac{1}{5} - \frac{1}{6} =$ _____

Find the total distance from House A to House B and then to House C.

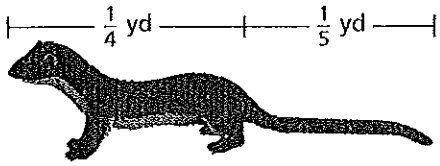
18. 

_____

19. 

_____

20. **WEASEL LENGTH** Find the total length of the weasel. _____



21. **IMPROVING YOUR SPEED** You swam at a rate of $\frac{3}{8}$ mile per hour in March. You swam at a rate of $\frac{3}{7}$ mile per hour in April. How much faster did you swim in April? _____

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REVIEW: Multiplying Fractions

Name _____

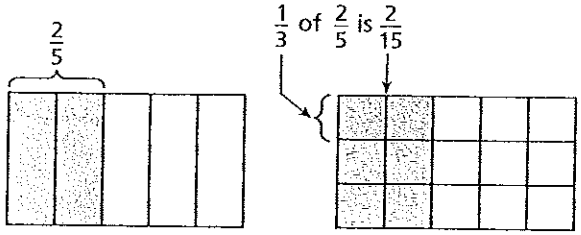
Key Concept and Vocabulary

Multiply numerators.

$$\frac{1}{3} \cdot \frac{2}{5} = \frac{1 \cdot 2}{3 \cdot 5} = \frac{2}{15}$$

Multiply denominators.

Visual Model



Skill Examples

1. $\frac{2}{3} \cdot \frac{1}{4} = \frac{2 \cdot 1}{3 \cdot 4} = \frac{2}{12} = \frac{1}{6}$
2. $\frac{3}{8} \times \frac{2}{9} = \frac{3 \cdot 2}{8 \cdot 9} = \frac{6}{72} = \frac{1}{12}$
3. $\left(\frac{2}{5}\right)\left(\frac{1}{4}\right) = \frac{2 \cdot 1}{5 \cdot 4} = \frac{2}{20} = \frac{1}{10}$
4. $\frac{1}{7} \cdot \frac{3}{5} = \frac{1 \cdot 3}{7 \cdot 5} = \frac{3}{35}$

Application Example

5. A recipe calls for three-fourths cup of flour. You want to make one-half of the recipe. How much flour should you use?

$$\frac{1}{2} \cdot \frac{3}{4} = \frac{1 \cdot 3}{2 \cdot 4} = \frac{3}{8}$$

$\therefore$ You should use $\frac{3}{8}$ cup flour.

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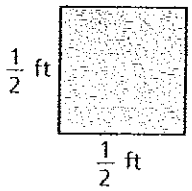
Check your answers at BigIdeasMath.com.

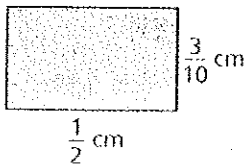
Find the product. Write your answer in simplified form.

6. $\frac{1}{3} \cdot \frac{2}{7} =$ _____
7. $\frac{1}{2} \times \frac{1}{4} =$ _____
8. $\frac{1}{10} \cdot \frac{3}{10} =$ _____
9. $\frac{3}{2} \times \frac{2}{5} =$ _____
10. $\frac{3}{8} \times \frac{1}{2} =$ _____
11. $\left(\frac{1}{5}\right)\left(\frac{2}{5}\right) =$ _____
12. $\left(\frac{2}{3}\right)^2 =$ _____
13. $\frac{3}{2} \cdot \frac{2}{3} =$ _____
14. $\left(\frac{3}{1}\right)\left(\frac{1}{3}\right) =$ _____
15. $2 \cdot \frac{1}{4} =$ _____
16. $3 \times \frac{3}{4} =$ _____
17. $\frac{1}{3} \cdot \frac{3}{4} \cdot \frac{4}{5} =$ _____

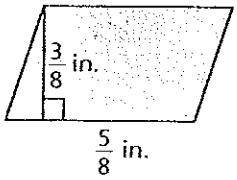
Find the area of the rectangle or parallelogram.

18. 

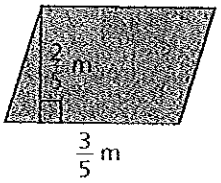
Area = _____

19. 

Area = _____

20. 

Area = _____

21. 

Area = _____

22. **OPEN-ENDED** Find three different pairs of fractions that have the same product.

$\square \cdot \square = \square$ $\square \cdot \square = \square$ $\square \cdot \square = \square$

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REVIEW: Dividing Fractions

Name _____

Key Concept and Vocabulary

$$\frac{2}{3} \div \frac{1}{2} = \frac{2}{3} \cdot \frac{2}{1} = \frac{2 \cdot 2}{3 \cdot 1} = \frac{4}{3}$$

Invert and multiply.

Visual Model

There are 2 "one-thirds" in two-thirds.

$$\frac{2}{3} \div \frac{1}{3} = \frac{2}{3} \cdot \frac{3}{1} = 2$$

Skill Examples

1. $\frac{2}{5} \div \frac{1}{5} = \frac{2}{5} \cdot \frac{5}{1} = \frac{2 \cdot 5}{5 \cdot 1} = 2$
2. $\frac{2}{5} \div 5 = \frac{2}{5} \cdot \frac{1}{5} = \frac{2 \cdot 1}{5 \cdot 5} = \frac{2}{25}$
3. $\frac{9}{4} \div \frac{3}{4} = \frac{9}{4} \cdot \frac{4}{3} = \frac{9 \cdot 4}{4 \cdot 3} = 3$
4. $6 \div \frac{1}{2} = \frac{6}{1} \cdot \frac{2}{1} = \frac{6 \cdot 2}{1 \cdot 1} = 12$

Application Example

5. You drive 25 miles in one-half hour. What is your average rate?

$$25 \div \frac{1}{2} = \frac{25}{1} \cdot \frac{2}{1} = 50 \text{ mi/h} \qquad r = \frac{d}{t}$$

∴ Your average rate is 50 miles per hour.

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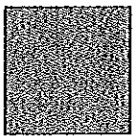
Check your answers at BigIdeasMath.com.

Find the quotient. Write your answer in simplified form.

6. $\frac{3}{5} \div \frac{1}{5} =$ _____
7. $4 \div \frac{1}{2} =$ _____
8. $\frac{2}{3} \div \frac{1}{6} =$ _____
9. $\frac{1}{6} \div \frac{2}{3} =$ _____
10. $\frac{2}{3} \div 2 =$ _____
11. $\frac{3}{4} \div 4 =$ _____
12. $\frac{3}{7} \div \frac{3}{7} =$ _____
13. $\frac{3}{7} \div \frac{7}{3} =$ _____
14. $5 \div \frac{1}{2} =$ _____
15. $\frac{9}{4} \div \frac{1}{4} =$ _____
16. $\frac{1}{4} \div \frac{1}{2} =$ _____
17. $\frac{3}{11} \div 11 =$ _____

Find the height of the rectangle or parallelogram.

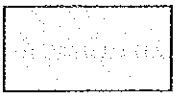
18. ___ ft



$\frac{1}{2}$ ft

Area $= \frac{1}{4}$ ft^2

19. ___ cm



$\frac{2}{5}$ cm

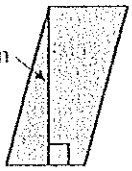
Area $= \frac{2}{25}$ cm^2

20.

$\frac{3}{8}$ in.

Area $= \frac{3}{16}$ in.^{2}

21. ___



$\frac{1}{10}$ m

Area $= \frac{1}{50}$ m^2

22. **SPEED** You drive 15 miles in one-fourth hour. What is your average speed? _____

23. **MAGNETIC TAPE** A refrigerator magnet uses $\frac{5}{8}$ inch of magnetic tape. How many refrigerator magnets can you make with 10 inches of magnetic tape? Explain.

_____

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REVIEW: Mixed Numbers and Improper Fractions

Name _____

Key Concept and Vocabulary

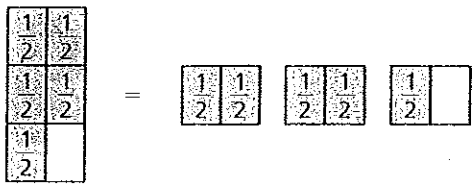
$\frac{5}{2} = 2\frac{1}{2}$

improper fraction

mixed number

Visual Model

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



Skill Examples

1. $\frac{7}{3} = 2\frac{1}{3}$
2. $\frac{8}{4} = 2$
3. $2\frac{1}{4} = \frac{8}{4} + \frac{1}{4} = \frac{9}{4}$
4. $3\frac{3}{5} = \frac{15}{5} + \frac{3}{5} = \frac{18}{5}$

Application Example

5. During a month, you used 13 half-hours of phone time. How many hours did you use?

13 halves → $\frac{13}{2} = 6\frac{1}{2}$ ← 6 and one-half

You used $6\frac{1}{2}$ hours.

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Check your answers at BigIdeasMath.com.

Write the improper fraction as a mixed number.

6. $\frac{4}{3} =$ _____
7. $\frac{3}{2} =$ _____
8. $\frac{8}{3} =$ _____
9. $\frac{9}{6} =$ _____
10. $\frac{7}{4} =$ _____
11. $\frac{28}{3} =$ _____
12. $\frac{19}{4} =$ _____
13. $\frac{11}{2} =$ _____

Write the mixed number as an improper fraction.

14. $2\frac{2}{3} =$ _____
15. $5\frac{1}{4} =$ _____
16. $3\frac{2}{5} =$ _____
17. $1\frac{3}{8} =$ _____

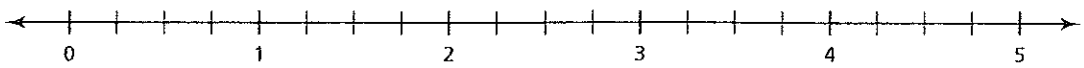
18. Rewrite the sentence using a mixed number. Susan drinks five-fourths of a quart of milk.

_____

19. Rewrite the sentence using an improper fraction. Tom runs for 2 and one quarter hours.

_____

20. **NUMBER LINE** Graph the improper fractions on the number line: $\frac{5}{3}$, $\frac{7}{2}$, and $\frac{13}{3}$.



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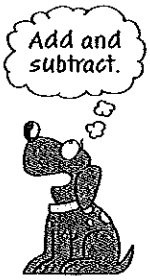
REVIEW: Adding and Subtracting Mixed Numbers

Name _____

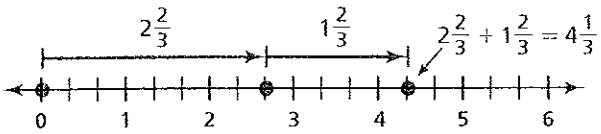
Key Concept and Vocabulary

$2\frac{2}{3} + 1\frac{2}{3} = 3\frac{4}{3} = 4\frac{1}{3}$

$5\frac{1}{5} - 1\frac{3}{5} = 4\frac{6}{5} - 1\frac{3}{5} = 3\frac{3}{5}$



Visual Model

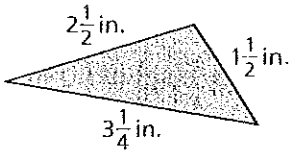


Skill Examples

1. $3\frac{1}{4} + 2\frac{1}{2} = 3\frac{1}{4} + 2\frac{2}{4} = 5\frac{3}{4}$
2. $5\frac{3}{5} + 1\frac{4}{5} = 6\frac{7}{5} = 7\frac{2}{5}$
3. $5\frac{5}{6} - 3\frac{1}{3} = 5\frac{5}{6} - 3\frac{2}{6} = 2\frac{3}{6} = 2\frac{1}{2}$
4. $4\frac{1}{3} - 1\frac{2}{3} = 3\frac{4}{3} - 1\frac{2}{3} = 2\frac{2}{3}$

Application Example

5. Find the perimeter of the triangle.



$2\frac{1}{2} + 1\frac{1}{2} + 3\frac{1}{4} = 7\frac{1}{4}$

∴ The perimeter is $7\frac{1}{4}$ inches.

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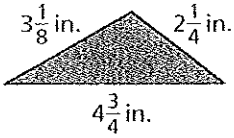
Check your answers at BigIdeasMath.com.

Find the sum or difference. Write your answer in simplified form.

6. $4\frac{1}{4} + 2\frac{1}{4} =$ _____
7. $1\frac{2}{5} + 3\frac{1}{5} =$ _____
8. $5\frac{4}{5} + 3\frac{4}{5} =$ _____
9. $2\frac{2}{3} + 4\frac{1}{6} =$ _____
10. $7\frac{2}{3} + 3\frac{1}{3} =$ _____
11. $5\frac{1}{2} + 5\frac{1}{2} =$ _____
12. $3\frac{1}{4} - 2\frac{1}{2} =$ _____
13. $4\frac{3}{4} - 1\frac{1}{2} =$ _____
14. $8\frac{3}{5} - 5\frac{3}{5} =$ _____
15. $7\frac{1}{6} - 3\frac{1}{3} =$ _____
16. $1\frac{1}{4} - \frac{1}{2} =$ _____
17. $6\frac{3}{4} - 6\frac{1}{2} =$ _____

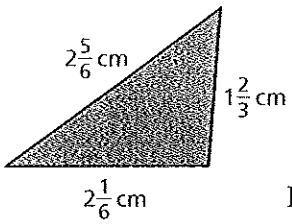
Find the perimeter of the triangle.

18.



Perimeter = _____

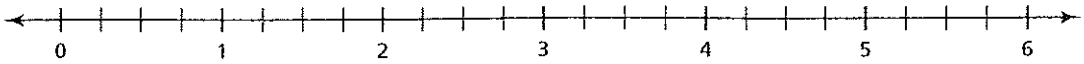
19.



Perimeter = _____

20. **HEIGHT** Sarah was $50\frac{1}{4}$ inches tall when she was 12 years old. She was $48\frac{1}{2}$ inches tall when she was 11 years old. How much did she grow during the year? _____

21. **NUMBER LINE** Show the sum graphically on the number line: $3\frac{1}{4} + 2\frac{1}{2}$.



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REVIEW: Comparing and Ordering Decimals

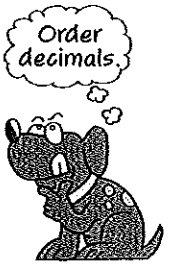
Name _____

Key Concept and Vocabulary

is less than → $1.23 < 1.24$

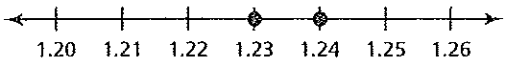
is greater than → $1.24 > 1.23$

inequality signs



Visual Model

Number Line



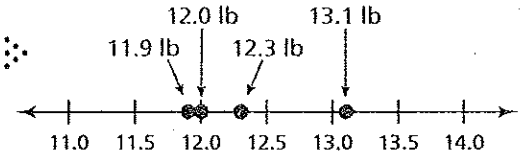
$1.23 < 1.24$ because 1.23 is to the left of 1.24 on the number line.

Skill Examples

1. $34.07 > 30.47$
2. $12.35 < 12.351$
3. $17{,}056.4 > 17{,}055.9$
4. $0.004 < 0.030$
5. $0.1003 > 0.0999$

Application Example

6. Order the weights from least to greatest: 12.3 lb, 11.9 lb, 12.0 lb, 13.1 lb.



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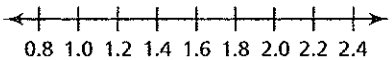
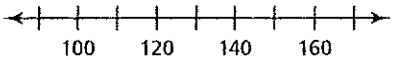
Check your answers at BigIdeasMath.com.

Graph the two numbers. Then compare them using <, >, or =.

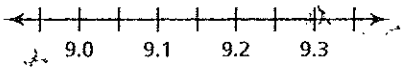
7. 1.6 ☐ 1.7



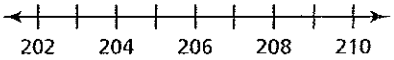
8. 130.5 ☐ 103.5



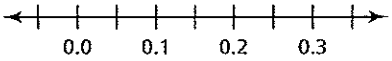
9. 9.2 ☐ 9.02



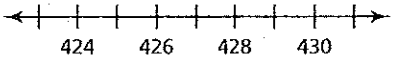
10. 203.7 ☐ 207.3



11. 0.32 ☐ 0.132



12. 427.8 ☐ 428.3



Order the lengths from least to greatest.

13. 32.5 ft, 29.9 ft, 32.3 ft, 31.7 ft, 31.75 ft

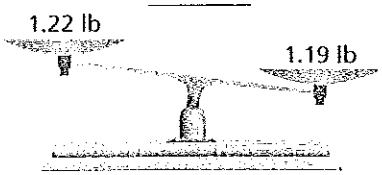
_____

14. 0.5 mi, 0.05 mi, 0.47 mi, 1.02 mi, 0.08 mi

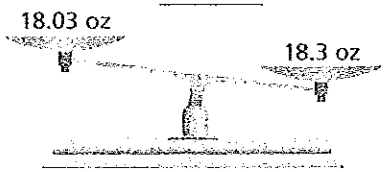
_____

Is the scale balanced correctly?

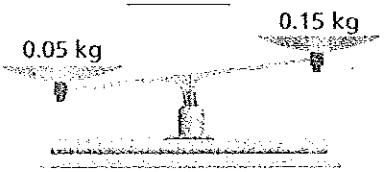
15. _____



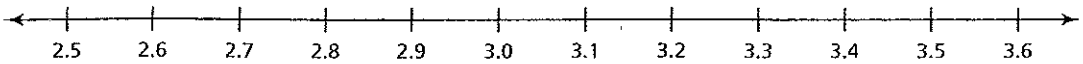
16. _____



17. _____



18. **NUMBER LINE** On the number line, shade all values of x for which $x \le 3.2$ and $x \ge 2.9$.



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REVIEW: Estimating Decimal Sums and Differences

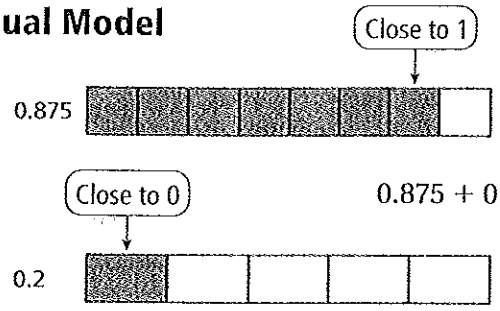
Name _____

Key Concept and Vocabulary

$1.46 + 2.63 \approx 1.5 + 2.5 = 4$

Estimate decimal part to be 0.0, 0.5, or 1.0.

Visual Model



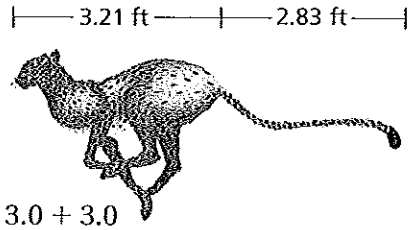
$0.875 + 0.2 \approx 1$

Skill Examples

1. $4.36 + 2.87 \approx 4.5 + 3.0 = 7.5$
2. $9.78 - 5.46 \approx 10.0 - 5.5 = 4.5$
3. $5.13 - 3.58 \approx 5.0 - 3.5 = 1.5$
4. $2.94 + 4.08 \approx 3.0 + 4.0 = 7.0$

Application Example

5. Approximate the total length of the cheetah.



$3.21 + 2.83 \approx 3.0 + 3.0$
$= 6.0$

∴ The cheetah's total length is about 6 feet.

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Estimate the sum or difference.

6. $3.65 - 2.72 \approx$ _____
7. $9.03 - 6.78 \approx$ _____
8. $2.35 + 5.67 \approx$ _____
9. $8.21 - 4.11 \approx$ _____
10. $5.68 + 4.38 \approx$ _____
11. $3.92 + 3.92 \approx$ _____
12. $2.61 + 3.45 \approx$ _____
13. $2.07 - 1.45 \approx$ _____
14. $10.04 - 6.79 \approx$ _____

Approximate the total cost of the two shirts.

15. $17.89 $15.07 _____

16. $23.49 $23.49 _____

17. **SHOPPING** At the grocery store, you buy items for $1.79, $3.15, $2.45, $9.08, and $3.49. Estimate the total amount you spend. _____

18. **MENTAL MATH** You buy 6 hamburgers that cost $3.45 each. Using only mental math, estimate the total amount of the 6 hamburgers.

_____

_____

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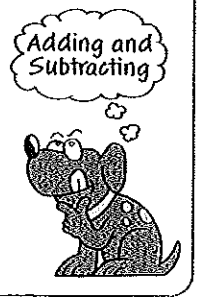
REVIEW: Adding and Subtracting Decimals

Name _____

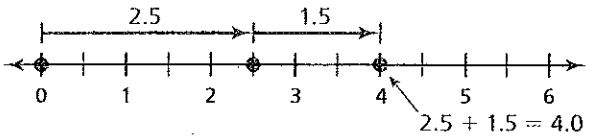
Key Concept and Vocabulary

$$\begin{array}{r} 5.7 \\ +\ 3.36 \\ \hline 9.06 \end{array} \qquad \begin{array}{r} 12.72 \\ -\ 3.84 \\ \hline 8.88 \end{array}$$

Align on decimal point.



Visual Model



Skill Examples

1. $\begin{array}{r} 134.12 \\ +\ 25.485 \\ \hline 159.605 \end{array}$

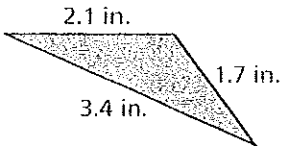
2. $\begin{array}{r} 0.135 \\ +\ 0.14 \\ \hline 0.275 \end{array}$

3. $\begin{array}{r} 32.000 \\ -\ 9.451 \\ \hline 22.549 \end{array}$

4. $\begin{array}{r} 1.405 \\ -\ 0.55 \\ \hline 0.855 \end{array}$

Application Example

5. Find the perimeter of the triangle.



$2.1 + 1.7 + 3.4 = 7.2$

∴ The perimeter is 7.2 inches.

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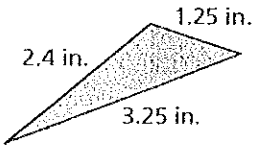
Check your answers at BigIdeasMath.com.

Find the sum or difference.

6. $4.75 + 3.56 =$ _____
7. $9.0 - 1.507 =$ _____
8. $2.4 + 2.04 =$ _____
9. $112.5 + 24.52 =$ _____
10. $5.7 - 4.81 =$ _____
11. $20 - 12.5 =$ _____
12. $2.3 + 3.4 + 5.9 =$ _____
13. $3.4 + 5.6 - 2.3 =$ _____
14. $10.0 - (4.5 + 2.3) =$ _____

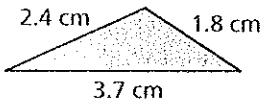
Find the perimeter of the triangle.

15.



Perimeter = _____

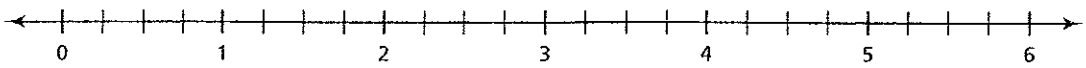
16.



Perimeter = _____

17. **SHOPPING** You take \$20 to the store. You buy a magazine for \$3.65 and a birthday card for \$5.29. How much money do you have left? _____

18. **NUMBER LINE** Show the sum graphically on the number line: $1.75 + 3.5$.



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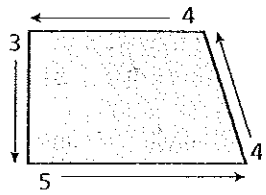
REVIEW: Perimeter

Name _____

Key Concept and Vocabulary

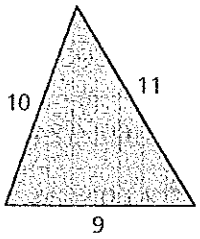


Perimeter = 3 + 5 + 4 + 4 = 16

Visual Model

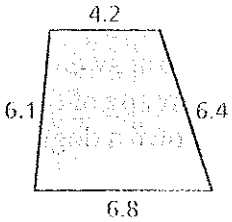
Perimeter = 10 + 9 + 11

= 30



Skill Examples

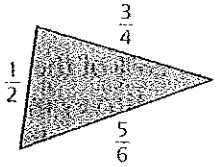
1.



$P = 6.1 + 6.8 + 6.4 + 4.2$

$= 23.5$

2.

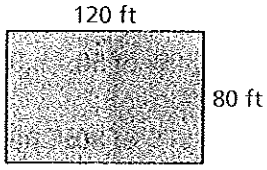


$P = \frac{1}{2} + \frac{5}{6} + \frac{3}{4}$

$= \frac{25}{12}$

Application Example

3. Find the length of fence needed to enclose the lot.



$P = 2(80) + 2(120)$

$= 160 + 240$

$= 400$

You need 400 feet of fence.

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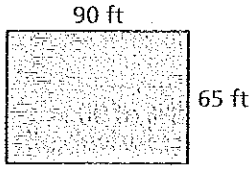
Check your answers at BigIdeasMath.com.

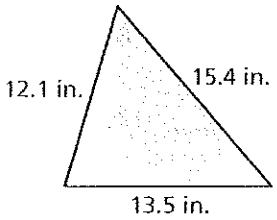
Find the perimeter of the figure.

4.



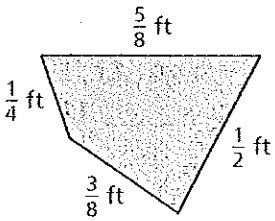
Perimeter = _____

5.



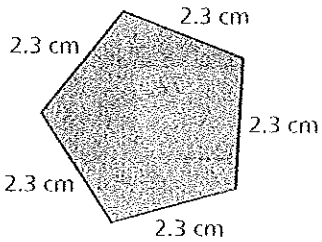
Perimeter = _____

6.



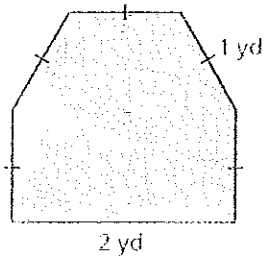
Perimeter = _____

7.



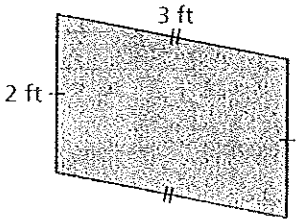
Perimeter = _____

8.



Perimeter = _____

9.



Perimeter = _____

10. RIBBON You are wrapping a ribbon around a rectangular box that is 18 inches long and 12 inches wide. What is the minimum amount of ribbon you need? _____

11. COUNTY LINE A county has the shape of a quadrilateral. The lengths of the four sides are 109 miles, 94 miles, 82 miles, and 109 miles. Find the perimeter of the county. _____

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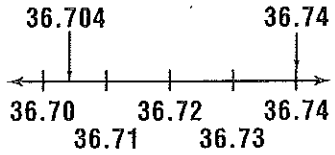
Name _____ Date _____

2-1 Study Guide

Comparing and Ordering Decimals

Which is greater, 36.74 or 36.704?

You can compare decimals like 36.74 and 36.704 on a number line. Numbers to the right are greater than numbers to the left.



You can also compare decimals by comparing the digits in each place-value position.

Find the first place in which the digits are different.	Compare the digits.	The decimal with the greater digit is greater.
36.704 36.74	0 is less than 4. $0 < 4$	$36.704 < 36.74$

Draw a number line to show which decimal is greater.

1. 0.39, 0.35

2. 1.95, 2.02

3. 6.55, 6.50

Replace each ◯ with <, >, or = to make a true sentence.

4. 8.05 ◯ 8.5

5. 0.76 ◯ 0.67

6. 18.20 ◯ 18.2

7. 7.004 ◯ 7.044

8. 6.79 ◯ 6.8

9. 29.922 ◯ 29.299

Order each set of numbers from least to greatest.

10. 0.067, 0.6, 0.76, 0.07

11. 56.2, 55.6, 52.2, 56.02

12. 600.09, 609.06, 600.9, 609.9

13. 0.88, 0.9, 0.08, 0.89

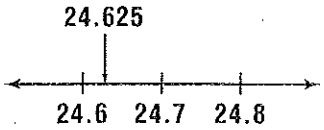
Name _____ Date _____

2-2 Study Guide

Rounding Decimals

Round 24.625 to the nearest tenth.

You can use a number line.



Find the approximate location of 24.625 on the number line.

24.625 is closer to 24.6 than to 24.7.
24.625 rounded to the nearest tenth is 24.6.

You can also round without a number line.

Find the place to which you want to round.	Look at the digit to the right of the place being rounded. The digit remains the same if the digit to the right is 0, 1, 2, 3, or 4. Round up if the digit to the right is 5, 6, 7, 8, or 9.	2 is less than 5. Do not change the digit.
24.625	24.625	24.6

Round each number to the underlined place-value position.

1. 4<u>6</u>.124 **2.** 29.<u>9</u>15 **3.** 15.1<u>7</u>33 **4.** 0.1<u>5</u>9

5. 308.<u>8</u>62 **6.** 0.05<u>6</u>1 **7.** 0.<u>5</u>77 **8.** 0.0<u>0</u>89

9. <u>2</u>.62 **10.** 76.05<u>5</u>2 **11.** 12.1<u>9</u>03 **12.** 0.<u>8</u>55

13. 3<u>3</u>1.98 **14.** 0.054<u>9</u> **15.** 6.<u>0</u>3 **16.** <u>1</u>73.99

17. 8<u>4</u>.012 **18.** 0.8<u>4</u>6 **19.** 12.76<u>4</u>2 **20.** 0.<u>0</u>62

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Name _____ Date _____

2-3 Study Guide

Estimating with Decimals

One way to estimate is by rounding to the greatest place-value position.

Example 1

$$\begin{array}{r} 73.2 \\ \underline{\times\ 9.6} \end{array} \longrightarrow \begin{array}{r} 70 \\ \underline{\times\ 10} \\ 700 \end{array}$$

Estimate a division problem by rounding the divisor. Then round the dividend to a multiple of the divisor.

Example 2 $72.8 \div 8.9 \longrightarrow 72.8 \div 9$

$72 \div 9 = 8$

Use clustering to estimate sums if the numbers group around a common quantity.

Example 3 **19.3 + 22.4 + 20.9 + 18.6 + 21.2 + 19.1 + 20.5 + 18.9**

All 8 numbers are clustered around 20. The sum is about 20×8 or 160.

Estimate. Use an appropriate strategy.

1.
$$\begin{array}{r} 32.19 \\ 29.36 \\ 30.08 \\ 28.9 \\ \underline{+\ 31.0} \end{array}$$

2.
$$\begin{array}{r} 5.6 \\ \underline{\times\ 2.1} \end{array}$$

3.
$$\begin{array}{r} 16.7 \\ \underline{-\ 12.2} \end{array}$$

4.
$$\begin{array}{r} 93.5 \\ 22.1 \\ 49.9 \\ \underline{+\ 18.8} \end{array}$$

5. $61.9 \div 7.1$

6. 8.8×2.1

7. $41.2 \div 5.9$

8. $56.82 - 21.12$

9.
$$\begin{array}{r} \$3.92 \\ \underline{+\ 4.18} \end{array}$$

10.
$$\begin{array}{r} 49.7 \\ \underline{\times\ 30.5} \end{array}$$

11.
$$\begin{array}{r} 9.74 \\ \underline{\times\ 4.08} \end{array}$$

12.
$$\begin{array}{r} \$41.15 \\ \underline{-\ 19.09} \end{array}$$

13. $878 \div 8$

14.
$$\begin{array}{r} 18.6 \\ \underline{\times\ 2.4} \end{array}$$

15. $97.7 \div 9.8$

16.
$$\begin{array}{r} \$45.92 \\ \underline{-\ 33.35} \end{array}$$

Name _____ Date _____

2-4 Study Guide

Multiplying Decimals

Multiply decimals just like you multiply whole numbers. The number of decimal places in the product is equal to the sum of the number of decimal places in the factors.

Example **Multiply 0.038 and 0.17.**

0.038	←	*three decimal places*
× 0.17	←	*two decimal places*
266		
38		
0.00646	←	*five decimal places*

The product is 0.00646.

Multiply.

1. 0.8 × 7

2. 0.04 × 0.3

3. 0.16 × 26

4. 0.003 × 4.2

5. 12.2 × 0.06

6. 0.0015 × 0.15

7. 1.9 × 2.2

8. 3.59 × 0.02

9. 12.2 × 0.007

10. 0.7 × 3.11

Evaluate each expression if m = 0.9 and n = 6.2.

11. $m \times 0.43$

12. $0.002 \times n$

13. $17.4 \times m$

14. $n \times 0.0001$

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2-6 Study Guide

Dividing Decimals

To divide by a decimal, change the divisor to a whole number.

Example **Find 0.5194 ÷ 0.49.**

1.06	*Change 0.49 to 49.*
0.49.)0.51.94	*Move the decimal point two places to the right.*
49	*Move the decimal point in the dividend the same number of places to the right.*
2 94	
2 94	
0	*Divide as with whole numbers.*

Without finding or changing each quotient, change each problem so that the divisor is a whole number.

1. 3.4 ÷ 1.1

2. 76.44 ÷ 0.006

3. 0.56 ÷ 0.4

4. 89.45 ÷ 0.908

5. 5.675 ÷ 6.8

6. 0.00864 ÷ 0.012

Divide.

7. $0.9\overline{)6.3}$

8. $0.6\overline{)0.540}$

9. $0.3\overline{)129}$

10. $2.4\overline{)0.192}$

11. $0.44\overline{)5.28}$

12. $0.025\overline{)0.04}$

13. $1.3\overline{)780}$

14. $0.08\overline{)0.0012}$

15. $0.7\overline{)5.95}$

Solve each equation.

16. $y = 0.0528 \div 0.06$

17. $16.84 \div 0.4 = m$

18. $k = 2.05 \div 0.5$

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2-7 Study Guide

Decimals and Fractions

To express a fraction as a decimal, divide the numerator of the fraction by the denominator.

Example **1** **Express $\frac{3}{8}$ as a decimal.**

$$\begin{array}{r} 0.375 \\ 8\overline{)3.000} \end{array} \qquad \frac{3}{8} = 0.375$$

A decimal like 0.375 is a terminating decimal. The decimal equivalents for some fractions are repeating decimals rather than terminating decimals. Use a bar to indicate the digits that repeat.

Examples **2** **Express $\frac{5}{12}$ as a decimal.**

$$\begin{array}{r} 0.41666 \\ 12\overline{)5.00000} \end{array} = 0.41\overline{6}$$

3 **Express $\frac{13}{33}$ as a decimal.**

$$\begin{array}{r} 0.393939\ldots \\ 33\overline{)13.000000} \end{array} = 0.\overline{39}$$

4 **Express $5\frac{2}{5}$ as a decimal.**

$$\begin{array}{r} 0.4 \\ 5\overline{)2.0} \end{array} = 0.4 \qquad 5\frac{2}{5} = 5.4$$

Express each fraction or mixed number as a decimal. If the decimal is a repeating decimal, use bar notation.

1. $\frac{7}{20}$ **2.** $\frac{7}{10}$ **3.** $\frac{3}{4}$ **4.** $\frac{4}{5}$

5. $\frac{9}{50}$ **6.** $\frac{1}{99}$ **7.** $\frac{7}{11}$ **8.** $\frac{1}{2}$

9. $\frac{11}{12}$ **10.** $\frac{5}{8}$ **11.** $\frac{7}{200}$ **12.** $\frac{17}{25}$

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4-10 Study Guide

Comparing and Ordering Fractions

To compare fractions, rewrite them so they have the same denominator. The **least common denominator (LCD)** of two fractions is the least common multiple of their denominators.

Example 1 **Which fraction is greater, $\frac{5}{6}$ or $\frac{3}{4}$?**

Find the LCD by listing the multiples of each denominator.

multiples of 6: 6, 12, 18, 24, 30, 36, . . .

multiples of 4: 4, 8, 12, 16, 20, 24, . . .

The LCM of 6 and 4 is 12. So, the LCD of $\frac{5}{6}$ and $\frac{3}{4}$ is 12.

Write $\frac{5}{6}$ and $\frac{3}{4}$ as fractions with a denominator of 12.

$$\frac{5}{6} \overset{\times 2}{\underset{\times 2}{=}} \frac{10}{12} \qquad \frac{3}{4} \overset{\times 3}{\underset{\times 3}{=}} \frac{9}{12}$$

$\frac{10}{12} > \frac{9}{12}$, so $\frac{5}{6} > \frac{3}{4}$.

Another way to compare fractions is to express them as decimals. Then compare the decimals.

Example 2 **Which fraction is greater, $\frac{7}{9}$ or $\frac{3}{4}$?**

Express each fraction as a decimal. Then compare.

$7 \div 9 = 0.\overline{7}$ $\qquad 3 \div 4 = 0.75$ $\qquad 0.\overline{7} > 0.75$, so $\frac{7}{9} > \frac{3}{4}$.

Find the LCD for each pair of fractions.

1. $\frac{1}{2}, \frac{1}{3}$ **2.** $\frac{3}{4}, \frac{1}{8}$ **3.** $\frac{5}{9}, \frac{1}{2}$ **4.** $\frac{2}{3}, \frac{3}{7}$

5. $\frac{5}{9}, \frac{5}{6}$ **6.** $\frac{7}{8}, \frac{5}{12}$ **7.** $\frac{7}{10}, \frac{4}{5}$ **8.** $\frac{3}{4}, \frac{1}{2}$

Replace each ◯ with <, >, or = to make a true sentence.

9. $\frac{1}{2}$ ◯ $\frac{5}{9}$ **10.** $\frac{3}{4}$ ◯ $\frac{7}{8}$ **11.** $\frac{5}{12}$ ◯ $\frac{1}{2}$ **12.** $\frac{4}{5}$ ◯ $\frac{7}{10}$

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7-1 Study Guide

Estimating with Fractions

Use rounding or patterns to estimate with fractions.

Rounding: For mixed numbers, round to the nearest whole number.

$4\frac{1}{6} + 3\frac{7}{8} \rightarrow 4 + 4 = 8$

$4\frac{1}{6} + 3\frac{7}{8}$ is about 8.

For proper fractions, round to 0, $\frac{1}{2}$ or 1.

$\frac{11}{12} - \frac{4}{9} \rightarrow 1 - \frac{1}{2} = \frac{1}{2}$

$\frac{11}{12} - \frac{4}{9}$ is about $\frac{1}{2}$.

Compatible Numbers:

$\frac{1}{4} \times 19\frac{1}{2} \rightarrow \frac{1}{4} \times 20 = 5$

20 is divisible by 4.

$\frac{1}{4} \times 19\frac{1}{2}$ is about 5.

$29\frac{1}{3} \div 3\frac{9}{10} \rightarrow 28 \div 4 = 7$

28 is divisible by 4.

$29\frac{1}{3} \div 3\frac{9}{10}$ is about 7.

Round each fraction to 0, $\frac{1}{2}$, or 1.

1. $\frac{7}{8}$ **2.** $\frac{1}{5}$ **3.** $\frac{11}{12}$ **4.** $\frac{3}{7}$ **5.** $\frac{4}{9}$

Round to the nearest whole number.

6. $6\frac{3}{4}$ **7.** $7\frac{2}{5}$ **8.** $4\frac{7}{9}$ **9.** $12\frac{2}{11}$ **10.** $1\frac{1}{7}$

Estimate.

11. $\frac{3}{5} + \frac{1}{4}$ **12.** $\frac{7}{9} - \frac{2}{5}$ **13.** $5\frac{1}{8} + 6\frac{9}{11}$

14. $3\frac{9}{10} - 2\frac{1}{8}$ **15.** $\frac{4}{5} \times \frac{7}{8}$ **16.** $3\frac{5}{6} \times 2\frac{1}{9}$

17. $\frac{1}{10} \times 27\frac{1}{2}$ **18.** $\frac{6}{7} \div \frac{11}{12}$ **19.** $16\frac{1}{3} \div 3\frac{7}{9}$

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7-2 Study Guide

Adding and Subtracting Fractions

To add and subtract fractions, rename the fractions with a common denominator as necessary. Then add or subtract the numerators and simplify.

Examples **Add or subtract. Write each sum or difference in simplest form.**

		Find the least common multiple (LCM).	*Rename the fractions with a common denominator.*	*Add numerators. Simplify.*
1	$\frac{7}{8}$	$8 = 2 \times 2 \times 2$	$\frac{7}{8} = \frac{21}{24}$	$\frac{21}{24}$
	$+\ \frac{7}{12}$	$12 = 2 \times 2 \times 3$	$+\ \frac{7}{12} = \frac{14}{24}$	$+\ \frac{14}{24}$
		The LCM of 8 and 12 is $2 \times 2 \times 2 \times 3$, or 24.		$\frac{35}{24} = 1\frac{11}{24}$

		Find the LCM.	*Rename.*	*Subtract. Simplify.*
2	$\frac{7}{9}$	$9 = 3 \times 3$	$\frac{7}{9} = \frac{14}{18}$	$\frac{14}{18}$
	$-\ \frac{1}{6}$	$6 = 2 \times 3$	$-\ \frac{1}{6} = \frac{3}{18}$	$-\ \frac{3}{18}$
		The LCM of 6 and 9 is $2 \times 3 \times 3$, or 18.		$\frac{11}{18}$

Add or subtract. Write each sum or difference in simplest form.

1. $\frac{5}{8} + \frac{1}{8}$

2. $\frac{7}{9} - \frac{2}{9}$

3. $\frac{1}{2} + \frac{3}{4}$

4. $\frac{2}{5} - \frac{1}{6}$

5. $\frac{4}{7} + \frac{1}{2}$

6. $\frac{11}{12} - \frac{2}{3}$

7. $\frac{4}{9} + \frac{5}{6}$

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

9. $\frac{1}{4} + \frac{3}{8}$

10. $\frac{8}{15} - \frac{2}{5}$

11. $\frac{7}{12} - \frac{3}{10}$

12. $\frac{1}{2} + \frac{1}{6}$

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7-3 Study Guide

Adding and Subtracting Mixed Numbers

To add or subtract mixed number:

1. Add or subtract the fractions. Rename if necessary.
2. Add or subtract the whole numbers.
3. Rename and simplify.

Examples

1

$$\begin{array}{r} 14\frac{1}{2} \\ +\ 18\frac{2}{3} \\ \hline \end{array} \longrightarrow \begin{array}{r} 14\frac{3}{6} \\ +\ 18\frac{4}{6} \\ \hline \end{array} \longrightarrow \begin{array}{r} 14\frac{3}{6} \\ +\ 18\frac{4}{6} \\ \hline \frac{7}{6} \end{array} \longrightarrow \begin{array}{r} 14\frac{3}{6} \\ +\ 18\frac{4}{6} \\ \hline 32\frac{7}{6} = 33\frac{1}{6} \end{array}$$

2

$$\begin{array}{r} 21 \\ -\ 12\frac{5}{8} \\ \hline \end{array} \longrightarrow \begin{array}{r} 20\frac{8}{8} \\ -\ 12\frac{5}{8} \\ \hline \end{array} \longrightarrow \begin{array}{r} 20\frac{8}{8} \\ -\ 12\frac{5}{8} \\ \hline \frac{3}{8} \end{array} \longrightarrow \begin{array}{r} 20\frac{8}{8} \\ -\ 12\frac{5}{8} \\ \hline 8\frac{3}{8} \end{array}$$

Complete.

1. $7\frac{1}{6} = 6\frac{\square}{6}$
2. $5\frac{2}{5} = 4\frac{\square}{5}$
3. $8\frac{1}{2} = 7\frac{\square}{2}$
4. $9 = 8\frac{\square}{7}$
5. $4\frac{12}{9} = \square\frac{1}{3}$
6. $7\frac{10}{8} = 8\frac{\square}{4}$

Add or subtract. Write each sum or difference in simplest form.

7. $8\frac{1}{7} + 5\frac{3}{7}$
8. $9\frac{3}{4} - 2\frac{1}{4}$
9. $6\frac{5}{8} + 3\frac{3}{8}$
10. $5\frac{1}{2} - 3\frac{1}{4}$
11. $6\frac{1}{3} + 2\frac{1}{6}$
12. $9 - 3\frac{2}{5}$
13. $2\frac{3}{4} + 7\frac{3}{4}$
14. $6\frac{1}{2} - 6\frac{1}{3}$
15. $18\frac{1}{2} + 5\frac{5}{8}$
16. $13\frac{2}{9} - 7\frac{1}{3}$
17. $15\frac{14}{15} + 13\frac{1}{2}$
18. $26 - 6\frac{12}{13}$

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7-4 Study Guide

Multiplying Fractions and Mixed Numbers

To multiply fractions: Multiply the numerators. Then multiply the denominators.

$$\frac{5}{6} \times \frac{3}{5} = \frac{5 \times 3}{6 \times 5} = \frac{15}{30} = \frac{1}{2}$$

To multiply mixed numbers: Rename each mixed number as a fraction. Multiply the fractions.

$$7 \times 1\frac{1}{4} = \frac{7}{1} \times \frac{5}{4} = \frac{35}{4} = 8\frac{3}{4}$$

Multiply. Write each product in simplest form.

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

2. $\frac{3}{7} \times \frac{1}{2}$

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

4. $\frac{1}{2} \times \frac{6}{7}$

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

6. $\frac{7}{10} \times \frac{5}{7}$

7. $\frac{4}{9} \times 3$

8. $\frac{1}{4} \times \frac{1}{4}$

9. $1\frac{1}{2} \times 6$

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

11. $3\frac{1}{3} \times 2\frac{1}{2}$

12. $4\frac{1}{5} \times \frac{1}{7}$

13. $1\frac{1}{9} \times \frac{3}{5}$

14. $6 \times \frac{11}{12}$

15. $\frac{1}{2} \times 2\frac{2}{3}$

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7-9 Study Guide

Dividing Fractions and Mixed Numbers

To divide fractions and mixed numbers:

1. Write any mixed numbers as improper fractions.
2. Find the reciprocal of the divisor.
3. Multiply the dividend by the reciprocal of the divisor.

Examples **1** $\frac{5}{8} \div \frac{5}{12}$ *The reciprocal of* $\frac{5}{12}$ *is* $\frac{12}{5}$.

$$\frac{5}{8} \div \frac{5}{12} = \frac{5}{8} \times \frac{12}{5}$$
$$= \frac{60}{40} \text{ or } 1\frac{1}{2}$$

2 $7 \div 3\frac{1}{2} \rightarrow \frac{7}{1} \div \frac{7}{2}$ *The reciprocal of* $\frac{7}{2}$ *is* $\frac{2}{7}$.

$$7 \div 3\frac{1}{2} = \frac{7}{1} \times \frac{2}{7}$$
$$= \frac{14}{7} \text{ or } 2$$

Name the reciprocal of each number.

1. $\frac{6}{11}$
2. $\frac{14}{5}$
3. 8
4. $\frac{1}{5}$

Divide. Write each quotient in simplest form.

5. $n = \frac{7}{8} \div \frac{1}{4}$
6. $p = \frac{2}{5} \div \frac{5}{8}$
7. $y = \frac{1}{3} \div \frac{1}{6}$
8. $8 \div \frac{1}{3} = k$
9. $\frac{5}{9} \div 5 = v$
10. $24 \div 1\frac{1}{2} = t$
11. $c = 2\frac{1}{2} \div 5$
12. $z = 3\frac{1}{3} \div \frac{2}{9}$
13. $m = \frac{5}{8} \div 2\frac{1}{2}$
14. $1\frac{1}{3} \div 2\frac{1}{2} = t$
15. $3\frac{1}{3} \div 1\frac{2}{5} = f$
16. $\frac{9}{10} \div 5\frac{2}{5} = k$