Name _____

• Adding Three or More Fractions

- To add 3 or more fractions:
  1. Find a common denominator. Look for the least common multiple (LCM).
  2. Rename the fractions.
  3. Add whole numbers and fractions.
  4. Simplify if possible.

Example: $\frac{1}{2} + \frac{1}{4} + \frac{3}{8}$ LCM is 8. Rename all fractions as eighths.

$\frac{4}{8} + \frac{2}{8} + \frac{3}{8} = \frac{9}{8} = 1\frac{1}{8}$ Add and simplify.

Practice:

Simplify 1–6.

1. $\frac{1}{2} + \frac{1}{3} + \frac{5}{6} =$ _____

2. $\frac{3}{4} + \frac{3}{8} + \frac{1}{2} =$ _____

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

4. $2\frac{3}{4} + 1\frac{1}{2} + 3\frac{5}{8} =$ _____

5. $2\frac{3}{8} + 3\frac{1}{2} + 2\frac{1}{4} =$ _____

6. $2\frac{1}{2} + 2\frac{1}{6} + 2\frac{2}{3} =$ _____

Name _____

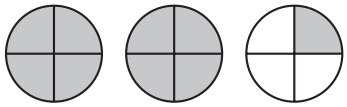
Reteaching 62

Math Course 1, Lesson 62

• Writing Mixed Numbers as Improper Fractions

• To change mixed numbers to improper fractions, do one of the following:

1. Cut the wholes into parts. **Count** the number of parts.



$2\frac{1}{4} = \frac{9}{4}$

2. Change the whole number into a fraction. Remember that $1 = \frac{4}{4}$.

$$2\frac{1}{4} = \frac{4}{4} + \frac{4}{4} + \frac{1}{4} = \frac{9}{4}$$

Try this shortcut:

1. Multiply the denominator times the whole number: $4 \times 2 = 8$
2. Add this product to the numerator: $8 + 1 = 9$
3. Keep the original denominator: $\frac{9}{4}$

Example: $2\ \frac{1}{4}$ (+ above, × below) Multiply; then add. $(4 \times 2) + 1 \rightarrow \frac{9}{4}$

Practice:

Simplify 1–4.

1. $2\frac{2}{3} =$ _____

2. $3\frac{3}{4} =$ _____

3. $1\frac{7}{8} =$ _____

4. $4\frac{5}{6} =$ _____

5. Write $3\frac{1}{3}$ as an improper fraction. Then multiply the improper fraction by $\frac{1}{4}$. Write the product as a reduced fraction.

_____

6. Write $2\frac{3}{4}$ as an improper fraction. Then multiply the improper fraction by $\frac{1}{2}$. Write the product as a reduced fraction.

_____

Name _____

• Subtracting Mixed Numbers with Regrouping, Part 2

- To subtract mixed numbers:
  1. **Rename** the fractions to have **common denominators.**
  2. If needed, **regroup. Combine** the renamed fractions in step 1 with the given fraction.
  3. Subtract. Simplify if possible.

Example:

Rename	Regroup	Combine
$5\frac{1}{2} = 5\frac{3}{6}$	$\overset{4}{\cancel{5}}\frac{3}{6} + \frac{6}{6} =$	$4\frac{9}{6}$
$-\ 1\frac{2}{3} = 1\frac{4}{6}$		$-\ 1\frac{4}{6}$
		$3\frac{5}{6}$

Practice:

Simplify 1–6.

1. $4\frac{5}{8}$
$-\ 1\frac{1}{2}$

2. $3\frac{3}{4}$
$-\ 2\frac{5}{12}$

3. $5\frac{1}{2} - 3\frac{2}{5} =$ _____

4. $4\frac{1}{4} - 1\frac{7}{8} =$ _____

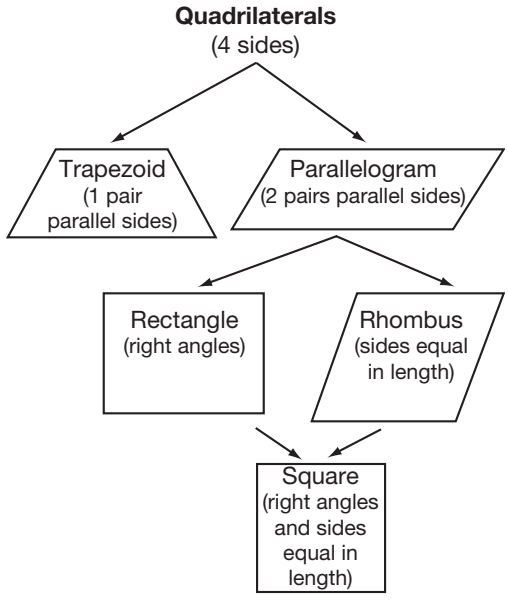
5. $6\frac{1}{2} - 2\frac{5}{6} =$ _____

6. $2\frac{1}{4} - \frac{5}{8} =$ _____

Name _____

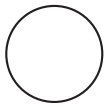
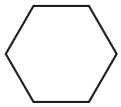
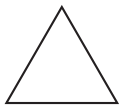
• Classifying Quadrilaterals

- A *square* is a special kind of rectangle.
- A *rectangle* is a special kind of parallelogram.
- A *parallelogram* is a special kind of quadrilateral.
- A *quadrilateral* is a special kind of polygon.
- A *square* is also a special kind of rhombus.

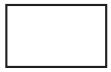


Practice:

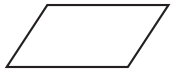
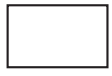
1. Which figure is a quadrilateral? _____

A.  **B.**  **C.**  **D.** 

2. Which figure is not a quadrilateral? _____

A.  **B.**  **C.**  **D.** 

3. Which quadrilateral is a rhombus? _____

A.  **B.**  **C.**  **D.** 

4. Which figure is not a parallelogram? _____

A. rectangle **B.** rhombus **C.** square **D.** trapezoid

5. True or false: A rhombus is a special kind of rectangle. _____

Name _____

• Prime Factorization

- A **prime number** has only two factors—itself and 1.
- A **composite number** has more than two factors.
- **Prime factorization** is writing a composite number as a product of its prime factors.

Division by Primes

1. Divide by smallest prime number factor.
2. Stack divisions. Continue to divide until the quotient is 1.
3. Write the factors in order.

Example:

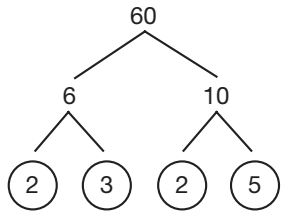
$$\begin{array}{r} 1 \\ 5\overline{)5} \\ 3\overline{)15} \\ 2\overline{)30} \\ 2\overline{)60} \end{array}$$

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

Factor Trees

1. List two factors.
2. Continue to factor until each factor is a prime number.
3. Circle the prime numbers. Remember: 1 is not prime.
4. Write the factors in order.

Example:



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

Practice:

1. Twenty-eight is a composite number. Use division by primes to find the prime factorization of 28. _____

2. Forty-five is a composite number. Use a factor tree to find the prime factorization of 45. _____

3. Thirty-two is a composite number. Use division by primes to find the prime factorization of 32. _____

4. Fifty-four is a composite number. Use a factor tree to find the prime factorization of 54. _____

Name _____

• Multiplying Mixed Numbers

- To multiply mixed numbers:
  1. First, write the numbers in fraction form.
  2. Change the mixed numbers to improper ("top heavy") fractions.
  3. Multiply numerators and denominators.
  4. Write whole numbers as improper fractions with a denominator of 1.
  5. Simplify the product.

Example: Change mixed numbers to improper fractions first.

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

$$\frac{5}{2} \times \frac{5}{3} = \frac{25}{6} \qquad \frac{25}{6} = 4\frac{1}{6}$$

Multiply. Then simplify.

Practice:

Simplify 1–6.

1. $1\frac{1}{3} \times 1\frac{1}{4} =$ _____

2. $1\frac{2}{3} \times 2\frac{1}{2} =$ _____

3. $3\frac{1}{3} \times 2 =$ _____

4. $3 \times 2\frac{2}{3} =$ _____

5. $1\frac{3}{4} \times 2\frac{1}{2} =$ _____

6. $2\frac{1}{4} \times 1\frac{1}{2} =$ _____

Name _____

• Using Prime Factorization to Reduce Fractions

- To reduce fractions using prime factorization:
  1. Write the prime factorization of the numerator and denominator.
  2. Then reduce the common factors and multiply the remaining factors.

Example:

1. $\frac{375}{1000} = \frac{3 \cdot 5 \cdot 5 \cdot 5}{2 \cdot 2 \cdot 2 \cdot 5 \cdot 5 \cdot 5}$

2. $\frac{3 \cdot \overset{1}{\cancel{5}} \cdot \overset{1}{\cancel{5}} \cdot \overset{1}{\cancel{5}}}{2 \cdot 2 \cdot 2 \cdot \underset{1}{\cancel{5}} \cdot \underset{1}{\cancel{5}} \cdot \underset{1}{\cancel{5}}} = \frac{3}{8}$

Practice:

1. Write the prime factorization of the numerator and denominator of $\frac{16}{36}$.

Then reduce. _____

2. Write the prime factorization of the numerator and denominator of $\frac{40}{72}$.

Then reduce. _____

3. Write the prime factorization of the numerator and denominator of $\frac{125}{200}$.

Then reduce. _____

4. Write the prime factorizations of 56 and 88 to reduce $\frac{56}{88}$. _____

5. Write the prime factorizations of 63 and 90 to reduce $\frac{63}{90}$. _____

6. Write the prime factorizations of 288 and 336 to reduce $\frac{288}{336}$. _____

Name _____

• Dividing Mixed Numbers

• To divide mixed numbers:

1. Write the mixed numbers as improper fractions.
2. Multiply the first fraction by the reciprocal of the second fraction. (Flip the second fraction.)
3. Multiply numerators and denominators.
4. Simplify the answer.

Example:

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

1. $\frac{8}{3} \div \frac{3}{2}$
2. $\frac{8}{3} \times \frac{2}{3}$
3. $\frac{8}{3} \times \frac{2}{3} = \frac{16}{9}$
4. $\frac{16}{9} = 1\frac{7}{9}$

Remember: The reciprocal of a whole number (such as 4) is $\frac{1}{\text{the number}}\left(\frac{1}{4}\right)$.

Practice:

Simplify 1–6.

1. $1\frac{1}{3} \div 3 =$ _____

2. $2\frac{1}{4} \div 1\frac{1}{4} =$ _____

3. $3 \div 1\frac{1}{2} =$ _____

4. $4 \div 1\frac{5}{7} =$ _____

5. $2\frac{1}{2} \div 1\frac{2}{5} =$ _____

6. $2\frac{2}{3} \div 4 =$ _____

Name _____

- **Lengths of Segments**
- **Complementary and Supplementary Angles**

Lengths of Segments

In this figure, the length of segment *JK* is 3 cm and the length of segment *JL* is 5 cm. What is the length of segment *KL*?

The length of segment *JK* plus the length of segment *KL* equals the length of segment *JL*.

3 cm + l = 5 cm

l = 2 cm So, the length of segment *KL* is 2 cm.

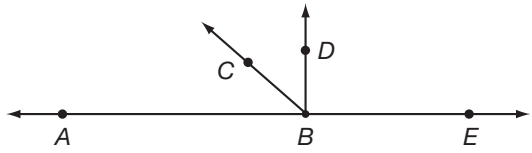
Complementary and Supplementary Angles

Complementary angles are two angles whose measures total 90°.

Supplementary angles are two angles whose measures total 180°.

$\angle ABC$ and $\angle CBD$ are complementary

$\angle ABD$ and $\angle DBE$ are supplementary



Practice:

1. In this figure, the length of segment *OP* is 6 cm and the length of segment *NP* is 10 cm. Find the length of segment *NO*. _____

2. A complement of a 30° angle is an angle that measures how many degrees?

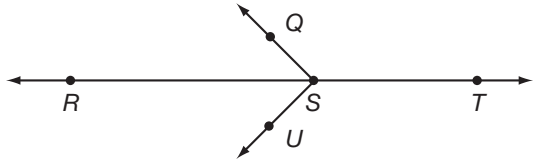
_____

3. A supplement of a 70° angle is an angle that measures how many degrees?

_____

4. Name two angles in the figure at right that appear to be supplementary.

_____



5. Name two angles in the figure at right that appear to be complementary.

_____

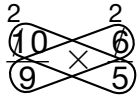
Name _____

• Reducing Fractions Before Multiplying

- Reducing before multiplying is also known as **canceling.**
- Canceling may be done to the terms of **multiplied** fractions only.
- Look for common terms in a diagonal.
- Reduce the common terms by dividing by a common factor.

Example: $\frac{10}{9} \times \frac{6}{5}$

Divide 10 and 5 by 5.



Divide 9 and 6 by 3.

Multiply the remaining terms. $\frac{2}{3} \times \frac{2}{1} = \frac{4}{3}$

Reduce. $\frac{4}{3} = 1\frac{1}{3}$

- Reducing before you multiply can save you from reducing after you multiply.

Long Way

$\frac{3}{5} \times \frac{2}{3} = \frac{6}{15}$ $\frac{6}{15}$ reduces to $\frac{2}{5}$

Short Way

$\frac{\overset{1}{\cancel{3}}}{5} \times \frac{2}{\underset{1}{\cancel{3}}} = \frac{2}{5}$

Practice:

Simplify 1–6.

1. $1\frac{2}{3} \times 1\frac{1}{2} =$ _____

2. $2\frac{1}{2} \times 2\frac{2}{3} =$ _____

3. $3\frac{1}{3} \times 1\frac{4}{5} =$ _____

4. $2\frac{2}{3} \times 1\frac{1}{8} =$ _____

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

6. $4 \times 2\frac{3}{4} =$ _____