Fraction Review

2-7 Greatest Common Factor

The **greatest common factor (GCF)** of two or more whole numbers is the greatest whole number that divides evenly into each number.

One way to find the GCF of two or more numbers is to list all the factors of each number. The GCF is the greatest factor that appears in all the lists.

Additional Example 1: Using a List to Find the GCF

Find the greatest common factor (GCF) of 12, 36, 54.

Factors of 12: 1, 2, 3, 4, 6, 12

Factors of 36: 1, 2, 3, 4, 6, 9, 12, 18, 36

Factors of 54: 1, 2, 3, 6, 9, 18, 27, 54

List all of the factors of each number.

Circle the greatest factor that is in all the lists.

The GCF is 6.

Check It Out: Example 1

Find the greatest common factor of 14, 28, 63.

14: 1, 2, 7, 14

28: 1, 2, 4, 7, 14, 28

63: 1, 3, 7, 9, 21, 63

List all of the factors of each number.

Circle the greatest factor that is in all the lists.

The GCF is 7.

A **multiple** of a number is a product of that number and a whole number. Some multiples of 7,500 and 5,000 are as follows:

7,500: 7,500, **15,000**, 22,500, 30,000, 37,500, 45,000, . . .

5,000: 5,000, 10,000, **15,000**, 20,000, 25,000, 30,000, . . .

A common multiple of two or more numbers is a number that is a multiple of each of the given numbers. So **15,000** and 30,000 are common multiples of 7,500 and 5,000.

2-8 Least Common Multiple

The **least common multiple (LCM)** of two or more numbers is the common multiple with the least value. The LCM of 7,500 and 5,000 is **15,000**. This is the lowest mileage at which both services are due at the same time.

Additional Example 1: Using a List to Find the LCM

Find the least common multiple (LCM).

A. 2, 7

Multiples of 2: 2, 4, 6, 8, 10, 12, 14

Multiples of 7: 7, 14, 21, 28, 35

The LCM is 14.

List some multiples of each number.

Find the least value that is in both lists.

B. 3, 6, 9

Multiples of 3: 3, 6, 9, 12, 15, 18, 21

Multiples of 6: 6, 12, 18, 24, 30

Multiples of 9: 9, 18, 27, 36, 45

The LCM is 18.

List some multiples of each number.

Find the least value that is in all the lists.

Check It Out: Example 1

Find the least common multiple (LCM).

A. 3, 7

Multiples of 3: 3, 6, 9, 12, 15, 18, 21

Multiples of 7: 7, 14, 21, 28

The LCM is 21.

List some multiples of each number.

Find the least value that is in both lists.

B. 2, 6, 4

Multiples of 2: 2, 4, 6, 8, 10, 12, 14

Multiples of 6: 6, 12, 18

Multiples of 4: 4, 8, 12

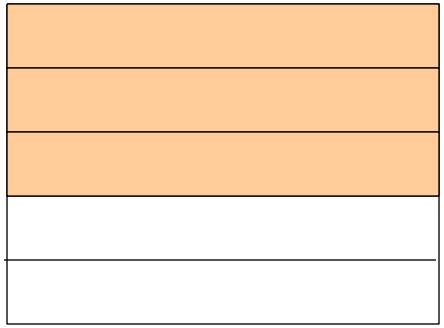
The LCM is 12.

List some multiples of each number.

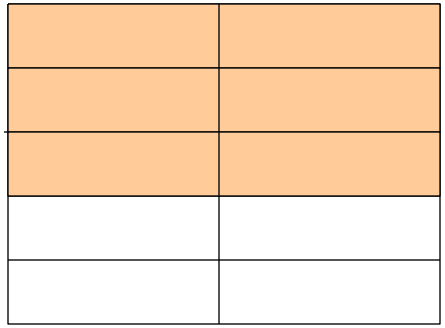
Find the least value that is in all the lists.

The pictures below are:

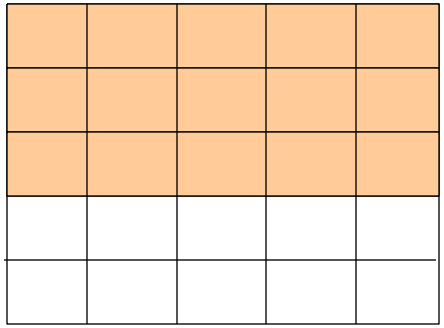
equivalent fractions because they are different expressions for the same number.



$\frac{3}{5}$ =



$\frac{6}{10}$ =



$\frac{15}{25}$

Additional Example 1: Finding Equivalent Fractions

Find two fractions equivalent to $\frac{5}{7}$.

$$\frac{5 \cdot 2}{7 \cdot 2} = \frac{10}{14}$$

Multiply numerator and denominator by 2.

$$\frac{5 \cdot 3}{7 \cdot 3} = \frac{15}{21}$$

Multiply numerator and denominator by 3.

Check It Out: Example 1

Find two fractions equivalent to $\frac{6}{12}$.

$$\frac{6 \cdot 2}{12 \cdot 2} = \frac{12}{24}$$

Multiply numerator and denominator by 2.

$$\frac{6 \div 2}{12 \div 2} = \frac{3}{6}$$

Divide numerator and denominator by 2.

Additional Example 2: Writing Fractions in Simplest Form

Write the fraction $\frac{18}{24}$ in simplest form.

Find the GCF of 18 and 24.

The GCF is 6

$$\frac{18}{24} = \frac{18 \div 6}{24 \div 6} = \frac{3}{4}$$

Divide the numerator and denominator by 6.

Check It Out: Example 2

Write the fraction $\frac{15}{45}$ in simplest form.

Find the GCF of 15 and 45.

The GCF is 15.

$$\frac{15}{45} = \frac{15 \div 15}{45 \div 15} = \frac{1}{3}$$

Divide the numerator and denominator by 15.

Additional Example 3A: Determining Whether Fractions are Equivalent

Determine whether the fractions in each pair are equivalent.

$\frac{4}{6}$ **and** $\frac{28}{42}$

Both fractions can be written with a denominator of 42.

$\frac{4}{6} = \frac{\times 7}{\times 7} \quad \frac{28}{42}$

$\frac{28}{42} = \frac{\quad}{\quad} \quad \frac{28}{42}$

The numerators are equal, so the fractions are equivalent.

Additional Example 3B: Determining Whether Fractions are Equivalent

Determine whether the fractions in each pair are equivalent.

$\frac{6}{10}$ **and** $\frac{20}{25}$

Both fractions can be written with a denominator of 50.

$$\frac{6}{10} = \frac{6 \cdot 5}{10 \cdot 5} = \frac{30}{50}$$

$$\frac{20}{25} = \frac{20 \cdot 2}{25 \cdot 2} = \frac{40}{50}$$

The numerators are not equal, so the fractions are not equivalent.

Check It Out: Example 2A

Determine whether the fractions in each pair are equivalent.

$\frac{3}{9}$ and $\frac{6}{18}$

Both fractions can be written with a denominator of 3.

$$\frac{3}{9} = \frac{3 \div 3}{9 \div 3} = \frac{1}{3}$$

$$\frac{6}{18} = \frac{6 \div 6}{18 \div 6} = \frac{1}{3}$$

The numerators are equal, so the fractions are equivalent.

Check It Out: Example 2B

Determine whether the fractions in each pair are equivalent.

$\frac{4}{12}$ **and** $\frac{9}{48}$

12 goes into 48, so 48 is the least common multiple.

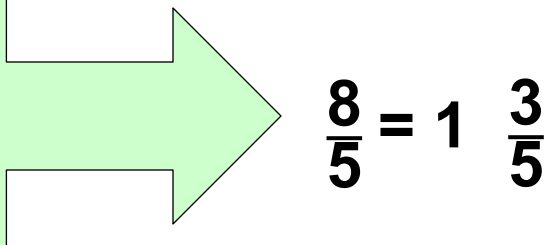
$\frac{4}{12} = \frac{\times 4}{\times 4} = \frac{16}{48}$

$\frac{9}{48} = \frac{\quad}{\quad} = \frac{9}{48}$

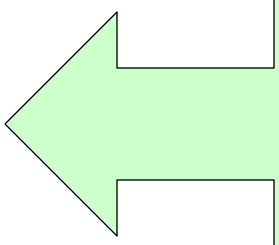
The numerators are not equal, so the fractions are not equivalent.

2-9 Equivalent Fractions and Mixed Numbers

$\frac{8}{5}$ is an **improper fraction**. Its numerator is greater than its denominator.



$\frac{8}{5} = 1\frac{3}{5}$



$1\frac{3}{5}$ is a **mixed number**. It contains both a whole number and a fraction.

Additional Example 4: Converting Between Improper Fractions and Mixed Numbers

A. Write $\frac{13}{5}$ as a mixed number.

First divide the numerator by the denominator.

$\frac{13}{5} = 2\ \frac{3}{5}$ *Use the quotient and remainder to write a mixed number.*

B. Write $7\ \frac{2}{3}$ as an improper fraction.

First multiply the denominator and whole number, and then add the numerator.

$= \frac{3 \cdot 7 + 2}{3} = \frac{23}{3}$ *Use the result to write the improper fraction.*

Check It Out: Example 4

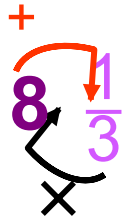
A. Write $\frac{15}{6}$ as a mixed number.

First divide the numerator by the denominator.

$\frac{15}{6} = 2\ \frac{3}{6} = 2\ \frac{1}{2}$ *Use the quotient and remainder to write a mixed number.*

B. Write $8\ \frac{1}{3}$ as an improper fraction.

First multiply the denominator and whole number, and then add the numerator.



$= \frac{3 \cdot 8 + 1}{3} = \frac{25}{3}$ *Use the result to write the improper fraction.*

Lesson Quiz

1. Write two fractions equivalent to $\frac{12}{24}$. $\frac{1}{2}, \frac{3}{6}$

2. Determine if $\frac{5}{12}$ and $\frac{4}{10}$ are equivalent. no

3. Write the fraction $\frac{16}{48}$ in simplest form. $\frac{1}{3}$

4. Write $\frac{17}{8}$ as a mixed number. $2\frac{1}{8}$

5. Write $4\frac{3}{7}$ as an improper fraction. $\frac{31}{7}$