

Name: \_\_\_\_\_

Date: \_\_\_\_\_

# Simplifying Fractions, Mixed and Improper Fractions

## 1. Greatest Common Factor (GCF), or Greatest Common Divisor (GCD)

The GCF of two values is the greatest value that divides evenly into both.  
Making a list of factors for each value may make it easier to find the GCF.

GCF of 12 and 18 is 6.  
12: 1 2 3 4 **6** 12  
18: 1 2 3 **6** 9 18

## 2. Simplifying (Reducing) Fractions to Lowest Terms

To simplify a fraction, divide the numerator and denominator by their GCF.  
Large values can be reduced in multiple steps, if necessary.  
A fraction is simplified when the GCF of the numerator and denominator is 1.

$$\frac{8}{6} = \frac{8 \div 2}{6 \div 2} = \frac{4}{3}$$
$$\frac{24}{36} = \frac{24 \div 4}{36 \div 4} = \frac{6 \div 3}{9 \div 3} = \frac{2}{3}$$

## 3. Mixed and Improper Fractions

To convert a mixed fraction to an improper one, multiply the denominator by the whole component, then add the numerator. The denominator remains the same.  
To convert an improper fraction to a mixed one, divide the numerator by the denominator. The quotient is the whole component, and the remainder is the numerator. The denominator remains the same.

## 4. Examples

### A. Simplify $\frac{32}{48}$ .

The GCF of 32 and 48 is 16, so  $\frac{32}{48} = \frac{32 \div 16}{48 \div 16} = \frac{2}{3}$ .

Alternatively, the fraction can be reduced in steps:  $\frac{32}{48} = \frac{32 \div 2}{48 \div 2} = \frac{16 \div 4}{24 \div 4} = \frac{4 \div 2}{6 \div 2} = \frac{2}{3}$ .

### B. Express $5\frac{3}{4}$ as an improper fraction.

Multiply the denominator (4) by the whole component (5), then add the numerator (3).

$$4 \times 5 + 3 = 23$$

The denominator stays the same, so  $5\frac{3}{4} = \frac{23}{4}$ .

### C. Simplify $\frac{26}{10}$ and express it as a mixed fraction.

The GCF of 26 and 10 is 2, so  $\frac{26}{10} = \frac{26 \div 2}{10 \div 2} = \frac{13}{5}$ .

To find the whole component, divide the numerator (13) by the denominator (5).

$$\frac{13}{5} = 2.6$$

Therefore, the whole component is 2. To find the new numerator, multiply the whole component (2) by the denominator (5) and subtract the result from the numerator (13).

$$2 \times 5 = 10$$
$$13 - 10 = 3$$

Therefore,  $\frac{13}{5} = 2\frac{3}{5}$ .