Pre-Algebra
Mixed Numbers and Improper Fractions

Definitions

A **proper fraction** is one in which (ignoring the sign) the numerator is less than the denominator. Proper fractions are between -1 and 1. It need not be in lowest terms.

An **improper fraction** is one in which (ignoring the sign) the numerator is greater than or equal to the denominator. Proper fractions are less than -1 or greater than 1. It need not be in lowest terms. Remember that being less than -1 means "more negative" than -1. So, for example, -2 and $-\frac{7}{5}$ are both less than -1.

A **mixed number** is a whole number followed by a proper fraction.

Examples:

Proper Fractions	$\frac{2}{3}, \frac{6}{7}, -\frac{1}{9}, \frac{375}{401}, -\frac{18}{20}$
Improper Fractions	$-\frac{4}{4}, \frac{17}{12}, -\frac{29}{2}, \frac{97}{96}, \frac{375}{25}$
Mixed Numbers	$2\frac{3}{4}, -6\frac{1}{2}, 13\frac{12}{21}, -1\frac{4}{7}, 365\frac{1}{4}$

Lowest Terms

A fraction is in **lowest terms** when it does not share any factors in the numerator and denominator. To put a fraction in lowest terms divide any common divisors out of both the numerator and denominator. E**xample:** $\frac{14}{22} = \frac{7}{11}$ when we divide the common factor 2 out of both the numerator and denominator.

Conversion between Mixed Numbers and Improper Fractions

Mixed Number to Improper Fraction:

Multiply the whole number by the denominator of the fraction and add it to the numerator of the fraction to get the numerator of the improper fraction:

$$2\frac{3}{4} = \frac{(2 \cdot 4) + 3}{4} = \frac{11}{4}$$

Improper Fraction to Mixed Number:

Divide the numerator by the denominator. Show the result as a whole number followed by the remainder expressed as a fraction:

$$\frac{11}{4} = 11 \div 4 = 2\ r\ 3 = 2\frac{3}{4}$$