

## Fix Those Fractions!! Self-Help Guide!

### Simplifying Fractions

To simplify fractions, look for a common factor (preferably the GCF – greatest common factor) between the numerator and the denominator. The *greatest common factor* is the largest number that can be divided into both numbers. Divide both the numerator and denominator by that common factor.

**Example #5: Simplify  $\frac{16}{24}$**

Find GCF (16, 24):	Factors of 16: 1, 2, 4, 8, 16 Factors of 24: 1, 2, 3, 4, 6, 8, 12, 24
Divide by GCF:	$\frac{16}{24} \div \frac{8}{8} = \frac{16 \div 8}{24 \div 8} = \frac{2}{3}$
Note that $\frac{8}{8} = 1$ . Does dividing a number by 1 change the value?	

Note that it is possible to divide by any common factor, continuing to simplify after each division. For example:

$$\frac{16}{24} \div \frac{2}{2} = \frac{8}{12} \div \frac{2}{2} = \frac{4}{6} \div \frac{2}{2} = \frac{2}{3}$$

The fraction is completely simplified when there are no common factors between the numerator and denominator. Note that the improper fraction  $\frac{7}{3}$  is in simplest form because there are no common factors between the numerator and denominator. It could be changed to a mixed number if preferred.

If the numbers are large, find the greatest common factor by listing the prime factors of each number **or continue to divide by a common factor** until there are no common factors remaining between the numerator and denominator.

**Example #6: Simplify  $\frac{168}{252}$**

To find GCF (168, 252), list the prime factors:	Prime Factors of 168: $2^3, 3, 7$ Prime Factors of 252: $2^2, 3^2, 7$
Multiply the common prime factors:	$2^2 \cdot 3 \cdot 7 = 84$
Divide by GCF:	$\frac{168}{252} \div \frac{84}{84} = \frac{168 \div 84}{252 \div 84} = \frac{2}{3}$

To simplify a complex fraction, such as  $\frac{\frac{2}{3}}{5}$  or  $\frac{\frac{2}{3}}{\frac{1}{5}}$ , see the Guide on Dividing Fractions.