Lesson 4-4

Example 1 Write a Fraction in Simplest Form

Write $\frac{12}{18}$ in simplest form.

Method 1 Divide by common factors.

$\frac{12}{18} = \frac{12 \div 2}{18 \div 2} = \frac{6}{9}$ 2 is a common factor of 12 and 18, so divide by 2.

$\frac{6}{9} = \frac{6 \div 3}{9 \div 3} = \frac{2}{3}$ 3 is a common factor of 6 and 9, so divide by 3.

The fraction $\frac{2}{3}$ is in simplest form since 2 and 3 have no common factors greater than 1.

Method 2 Divide by the GCF.

First, find the GCF of the numerator and denominator.
factors of 12: 1, 2, 3, 4, 6, 12
factors of 18: 1, 2, 3, 6, 9, 18
The GCF of 12 and 18 is 6.

Then, divide the numerator and denominator by the GCF, 6.

$\frac{12}{18} = \frac{12 \div 6}{18 \div 6} = \frac{2}{3}$

So, $\frac{12}{18}$ written in simplest form is $\frac{2}{3}$.

Example 2 Write Fractions in Simplest Form

Write $\frac{24}{32}$ in simplest form.

First, find the GCF of the numerator and denominator.
factors of 24: 1, 2, 3, 4, 6, 8, 12, 24
factors of 32: 1, 2, 4, 8, 16, 32
The GCF of 24 and 32 is 8.

Then, divide the numerator and denominator by the GCF, 8.

$\frac{24}{32} = \frac{24 \div 8}{32 \div 8} = \frac{3}{4}$

So, $\frac{24}{32}$ written in simplest form is $\frac{3}{4}$.

Example 3 Use Fractions to Solve a Problem
MARATHONS Officials estimate that 75 of the 120 runners starting a marathon will run the entire race. Write this fraction in simplest form.

$75 = 3 \cdot 5 \cdot 5$
$120 = 2 \cdot 2 \cdot 2 \cdot 3 \cdot 5$

The GCF of 75 and 120 is $3 \cdot 5$, or 15.

$$\frac{75}{120} = \frac{75 \div 15}{120 \div 15} = \frac{5}{8}$$

The fraction of runners who will run the entire race is $\frac{5}{8}$.