Equations and Inequalities with Rational Numbers

So far you have followed these steps to solve equations with fractions:

- Undo any addition or subtraction in order to get the variable term alone on one side of the equation.
- Multiply both sides of the equation by the multiplicative inverse of the coefficient of the variable term.

Another way to solve an equation with fractions is to clear fractions by multiplying each side of the equation by the LCD of the fractions. The resulting equation is equivalent to the original equation.

Example 1: Solving an Equation by Clearing Fractions

$-\frac{5}{6}x + \frac{1}{2} = \frac{3}{4}$ — Original equation.

$\mathbf{12}\left(-\frac{5}{6}x + \frac{1}{2}\right) = \mathbf{12}\left(\frac{3}{4}\right)$ — Multiply each side by LCD of fractions.

$12\left(-\frac{5}{6}x\right) + 12\left(\frac{1}{2}\right) = 12\left(\frac{3}{4}\right)$ — Use distributive property.

$-10x + 6 = 9$ — Simplify.

$-10x + 6 \mathbf{- 6} = 9 \mathbf{- 6}$ — Subtract 6 from each side.

$-10x = 3$ — Simplify.

$\frac{-10x}{-10} = \frac{3}{-10}$ — Divide each side by -10.

$x = -\frac{3}{10}$ — Simplify.

Solving Inequalities: You can use the methods you have learned for solving equations with fractional coefficients to solve inequalities.