

## Remembering Again: Expressions/Equations/Inequalities

It is always important that we remember the differences between those three math constructions: *expressions*, *equations* and *inequalities*. Let's again list what to look for in each:

Expressions

Equations

Inequalities

## Using Reciprocals To Solve Equations With Fractions

A *reciprocal* of a number is another name for the *multiplicative inverse* of the number. This means that it is the number you need to multiply by to get 1. In other words, it is the “upside down” version of the number. Let's look at some quick examples:

$$\text{Number} = \frac{2}{3} \longrightarrow \text{Reciprocal} = \frac{3}{2} \longrightarrow \text{Because } \frac{2}{3} \cdot \frac{3}{2} = 1$$

$$\text{Number} = -3 \longrightarrow \text{Reciprocal} = -\frac{1}{3} \longrightarrow \text{Because } -3 \cdot -\frac{1}{3} = 1$$

The reason why reciprocals are so important is because they can be used to quickly solve some types of equations. If the variable is multiplied by a fraction, all you need to do is multiply both sides of the equation by the reciprocal. Let's try some examples:

$$\bullet \frac{1}{2}x = 10$$

$$\bullet \frac{2}{3}x = -6$$

$$\bullet \frac{-3}{4}x = -6$$

$$\bullet -2 = \frac{1}{2}x$$

Now you can practice with a variety of one-step equations. Some of these are based on using reciprocals, and some are not. Solve each equation for the variable:

$$1. \frac{3}{2}x = 9$$

$$2. \frac{16}{7}x = 12$$

$$3. -7 = x - 3$$

$$4. -7x = 14$$

$$5. \frac{1}{3}x = -12$$

$$6. -10 = x + 4$$

$$7. \frac{-x}{2} = -4$$

$$8. \frac{2}{3}x = -12$$

$$9. \frac{8}{-11}x = 7$$

$$10. -15 + x = 49$$

$$11. 89 = 48 + x$$

$$12. 15x = -75$$

$$13. \frac{x}{-5} = 12$$

$$14. -8 = x + 18$$

$$15. \frac{17}{3}x = -17$$

$$16. -50 = 7x$$

$$17. 30 = 9x$$

$$18. \frac{8}{17}x = -3$$

$$19. -3x = 8$$

$$20. -5 = x - 7$$

$$21. x + 3 = -11$$

$$22. \frac{x}{8} = -12$$