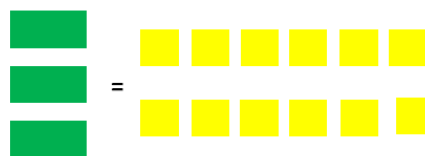


Solving Equations Using Multiplication or Division

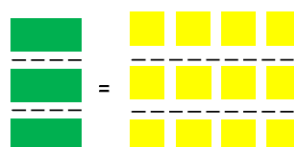
You can use algebra tiles to model and solve simple multiplication equations.

Use algebra tiles to solve $3x = 12$.

Model $3x = 12$ with algebra tiles



There are three x-tiles, so divide the x-tiles and 1-tiles into three equal groups



One x-tile is equal to four 1-tiles. So, the solution of $3x = 12$ is 4



Division Property of Equality

Words: Dividing each side of an equation by the same nonzero number produces an equivalent equation.

Numbers: If $3x = 12$, then $\frac{3x}{3} = \frac{12}{3}$, or $x = 4$.

Algebra: If $ax = b$ and $a \neq 0$, then $\frac{ax}{a} = \frac{b}{a}$.

Example 1: Solve $-6x = 48$. Then check if the solution is accepted

$$-6x = 48$$

$$\underline{-6x = 48}$$

$$\underline{-6} \quad \underline{-6}$$

$$x = -8$$

Write original equation.

Divide each side by -6 .

Simplify.

The solution is -8 .

Check $-6x = 48$ Write original equation.

$$-6(-8) = 48 \quad \text{Substitute } -8 \text{ for } x.$$

$$48 = 48 \checkmark \quad \text{Solution checks.}$$

Multiplication Property To solve an equation that involves division, you can use the multiplication property of equality.

Multiplication Property of Equality.

Words: Multiplying each side of an equation by the same nonzero number produces an equivalent equation.

Numbers: If $\frac{x}{3} = 12$, then $3 \cdot \frac{x}{3} = 3 \cdot 12$, or $x = 36$.

Algebra: If $\frac{x}{a} = b$ and $a \neq 0$, then $a \cdot \frac{x}{a} = a \cdot b$, or $x = ab$.