

Algebra 1

Chapter 2
Section 2-1

Vocabulary

Equivalent
Equations

Equations that have the same solution.

Isolate

Getting a term alone on one side of an equation

Inverse
Operation

Operation that undoes another operation.

Properties of Equality

Take note

Property Addition and Subtraction Properties of Equality

Addition Property of Equality Adding the same number to each side of an equation produces an equivalent equation.

Algebra

For any real numbers a , b , and c ,

if $a = b$, then $a + c = b + c$.

Example

$$x - 3 = 2$$

$$x - 3 + 3 = 2 + 3$$

Subtraction Property of Equality Subtracting the same number from each side of an equation produces an equivalent equation.

Algebra

For any real numbers a , b , and c ,

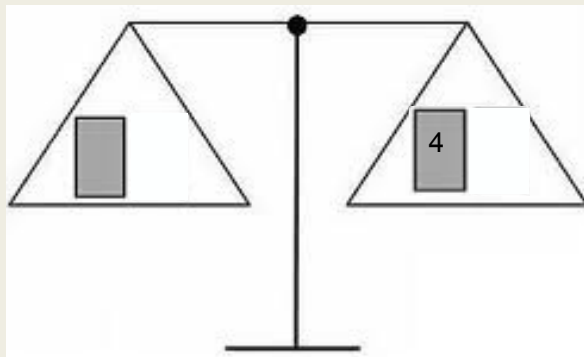
if $a = b$, then $a - c = b - c$.

Example

$$x + 3 = 2$$

$$x + 3 - 3 = 2 - 3$$

Solving Equations (Balance Scale Model)



Solving One-Step Equations

$$\begin{array}{r} x + 1 = 5 \\ -1 \quad -1 \\ \hline x = 4 \end{array}$$

$$\begin{array}{r} n - 4 = 3 \\ +4 \quad +4 \\ \hline n = 7 \end{array}$$

$$\begin{array}{r} 7 = y - 2 \\ +2 \quad +2 \\ \hline 9 = y \end{array}$$

More Properties of Equality

take note

Property Multiplication and Division Properties of Equality

Multiplication Property of Equality Multiplying each side of an equation by the same nonzero number produces an equivalent equation.

Algebra

For any real numbers a , b , and c ,
if $a = b$, then $a \cdot c = b \cdot c$.

Example

$$\begin{array}{l} \frac{x}{3} = 2 \\ \frac{x}{3} \cdot 3 = 2 \cdot 3 \end{array}$$

Division Property of Equality Dividing each side of an equation by the same nonzero number produces an equivalent equation.

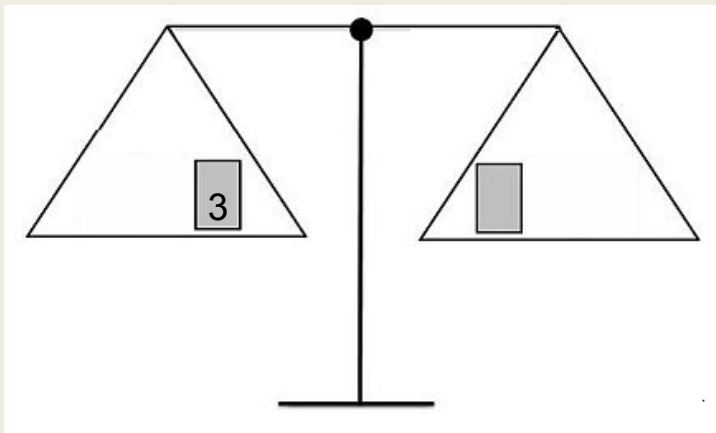
Algebra

For any real numbers a , b , and c , such
that $c \neq 0$, if $a = b$, then $\frac{a}{c} = \frac{b}{c}$.

Example

$$\begin{array}{l} 5x = 20 \\ \frac{5x}{5} = \frac{20}{5} \end{array}$$

Multiplication and Division (Balance Scale Model)



$$9 = 3x$$

$$3 = x$$

Solving One-Step Equations

$$3y = 6$$

$$3y(1/3) = 6(1/3)$$

$$y = 2$$

$$n/4 = 6$$

$$(4)n/4 = (4)6$$

$$n = 24$$

$$17 = y/2$$

$$(2)17 = (2)y/2$$

$$34 = y$$

Equations with Fractions

$$\frac{6}{7} \cdot x = \frac{1}{7}$$

$$\left(\frac{7}{6}\right) \frac{6}{7} \cdot x = \frac{1}{7} \left(\frac{7}{6}\right)$$

$$x = \frac{7}{42} = \frac{1}{6}$$

$$\frac{2}{5} \cdot n = 10$$

$$\left(\frac{5}{2}\right) \frac{2}{5} \cdot n = 10 \left(\frac{5}{2}\right)$$

$$n = \frac{50}{2} = 25$$