

Solving Equations Guided Notes

Reflexive Property	For all real numbers x , $x = x$ A number equals itself	These three Properties define an equivalence relation
Reflexive Property	For all real numbers x and y , If $x = y$, then $y = x$ Order of equality does not matter	
Transitive Property	For all real numbers x and y , If x, y and z If $x = y$ and $y = z$ then $x = z$ Two numbers equal to the same number are equal to each other	
Addition Property	For all real numbers x, y and z , If $x = y$, then $x + z = y + z$	These properties allow you to balance and solve equations involving real numbers
Subtraction Property	For all real numbers x, y and z , If $x = y$, then $x - z = y - z$	
Multiplication Property	For all real numbers x, y and z , If $x = y$, then $xz = yz$	
Division Property	For all real numbers x, y and z , If $x = y$, and $z \neq 0$, then $\frac{x}{z} = \frac{y}{z}$	

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Substitution Property	For all real numbers x and y , If $x = y$, then y can be substituted for x in any expression	For more, see the section on the distributive property
Distributive Property	For all real numbers x, y and z , $x(y + z) = xy + xz$	

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Questions:

1. Solve the following equation for x

$$2x + 6 = 3x + 9$$

$$6 - 9 = 3x - 2x$$

$$x = -3$$

2. Solve the following equation for x

$$4(2x + 6) = 2(-4x - 10)$$

$$8x + 24 = -8x - 20$$

$$8x + 8x = -20 - 24$$

$$16x = -44$$

$$x = -\frac{11}{4}$$

3. Solve the following equation for x

$$\frac{x + 4}{6} = 10$$

$$x + 4 = 6 \times 10$$

$$x + 4 = 60$$

$$x = 60 - 4$$

$$x = 56$$

4. A restaurant charges \$9.95 for a large pizza with two toppings, and \$1.25 for each additional topping. John bought a pizza which cost him \$13.7. Find the number of toppings.

$$9.95 + 1.25x = 13.7$$

$$1.25x = 13.7 - 9.95$$

$$1.25x = 3.75$$

$$x = \frac{3.75}{1.25}$$

$$x = 3 \text{ toppings}$$