Name_____
Date _____

Module #1:
Worksheet 3d: ***Solving Linear Equations***

View Tutorial 3d

Objective: *Use the addition, subtraction, multiplication, and division properties of equality in order to solve one-step equations.*

To solve an equation means to determine its solution set. You can use the addition, subtraction, multiplication, and division properties of equality to solve some equations. To check your solution, substitute the solution for the variable in the original equation. If the resulting sentence is true, your solution is correct.

Definition, Rule, or Property		**Example**
Addition Property of Equality	For any numbers a, b, and c, if a = b, then a + c = b + c. *If two sides of an equation are said to be equal, then adding the same quantity to both sides will not change the validity of the true statement. For example:* *5=5 is a true statement. If the same quantity is added to both sides, it will still be a true statement.* *5+3 = 5+3* *8 = 8 True*	**Solve r – 6 = –11** *Use the addition property by adding 6 to each side.* r – 6 = –11 r – 6 + 6 = –11 + 6 r = –5 --- Check if –5 is a solution to the original equation Check: r – 6 = –11 –5 – 6 **?** –11 –11 = –11 ✓
Subtraction Property of Equality	For any numbers a, b, and c, if a = b, then a – c = b – c. *Many equations that involve addition may be solved by using the subtraction property. Subtract the same number from each side to undo addition.*	**Solve k + 18 = –9** *Use the subtraction property by subtracting 18 from each side.* k + 18 = –9 k + 18 – 18 = –9 – 18 k = –27 --- Check if –27 is a solution to the original equation. Check: k + 18 = –9 –27 + 18 **?** –9 –9 = –9 ✓

1. Does the number –3 satisfy the equation 10 = 13 – x? Why or Why not?

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2. Is 6 a solution of the equation x + 4 = –2? Why or Why not?

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Solve the following equations and check your answer:

3. 3 + 2 = y

4. f – 3 = 6

5. x + 4 = 1

6. 30 = m + 2

7. t – 6 = 12

8. 22 = x – 1

Combining Like Terms to Solve Equations

Solving Equations

You order 3 coffees and returned two that were not hot. Each drink is the same price. With a candy bar, which costs $1.00, the total bill is $3.75. Solve the equation 3d - 2d + 1.00 = 3.75 to find the cost of one drink. d represents the cost of one drink.

3d - 2d + 1.00 = 3.75
d + 1.00 = 3.75 ← Combine like terms.
d + 1.00 – 1.00 = 3.75 – 1.00 ← Subtract 1.00 from each side.
d = 2.75

Each drink costs $2.75.

9. -4y +5y + 6 = 23

10. 3n – 2n + 13 = 17

11. 42 = 3a - 2a – 5

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Definition, Rule, or Property		Example
Multiplication Property of Equality	For any numbers a, b, and c, if a = b, then ac = bc.	**Solve** $\frac{1}{4}n = 16$ *Use the multiplication property by multiplying each side by 4.* $\frac{1}{4}n = 16 \Rightarrow 4\left(\frac{1}{4}n\right) = 16(4)$ $n = 64$ Check: $\frac{1}{4}n = 16 \Rightarrow \frac{1}{4}64 = 16 \Rightarrow 16 = 16$ ✓
Division Property of Equality	For any numbers a, b, and c, with $c \neq 0$, if a = b, then a ÷ c = b ÷ c.	**Solve 8n = 64** *Use the division property by dividing each side by 8.* $8n = 64$ $\frac{8n}{8} = \frac{64}{8}$ $n = 8$ Check: $8n = 64 \Rightarrow 8(8) = 64 \Rightarrow 64 = 64$ ✓

Solve the following equations:

12. $\frac{y}{9} = 3$ _____

13. $2h = 6$ _____

14. $\frac{b}{3} = 7$ _____

15. $4x - 9x = -30$ _____

16. $t + 2t = -2$ _____

17. $\frac{f}{6} = 6$ _____

18. $12 = \frac{y}{5}$ _____

19. $-\frac{x}{4} = 7$ _____

20. $\frac{1}{3}x = 5$ _____