

# Chapter 2 Student Success Sheet (SSS)

## *Solving Linear Equations*

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Olathe East High School – Intermediate Algebra

Name: \_\_\_\_\_  
Hour: \_\_\_\_\_

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“Failure is success if we learn from it.”

Malcolm Forbes

Concept #	What we will be learning...	Videos
1	One and two-step equations (all whole numbers)	3
2	Multi-step equations, combining like terms and distributive property (all whole numbers)	3
3	Equations with variables on both sides, combining like terms, and distributive property	3
4	Equations with special solutions – identities and no solutions	1

**Simplify**

vs.

**Solve**

In math, we simplify \_\_\_\_\_.

In math, we solve \_\_\_\_\_.

Example:

Example:

What do you notice?

What do you notice?

## #1 One and Two-Step Equations (all whole numbers)

### Solving Equations (Hokey Pokey)

Get your variables here  
Put your constants there  
Do the opposite operation  
Just to keep things fair  
Subtract and Add first  
Till they're all on their own side  
Then it's time to divide!

Before you get too crazy  
Draw your fence as a line  
Separating the equation  
By the equals sign  
Check for distribution  
And then you can combine  
Like terms on the same side!

You have:	Opposite operation:
+	
-	
.	
$\div$	

I must be \_\_\_\_\_.

If I do something to  
the \_\_\_\_\_,  
I must do the same  
thing to the \_\_\_\_\_!

1. An \_\_\_\_\_ is a set of expressions that have an \_\_\_\_\_ sign, dividing it into \_\_\_\_\_ sides.
2. Solving an equation means \_\_\_\_\_.
3. It doesn't matter if the \_\_\_\_\_ is on the \_\_\_\_\_ or the \_\_\_\_\_ side of the equals sign.

1)  $33 = -3n$

2)  $\frac{a}{15} = 3$

3)  $\frac{p}{15} = 10$

4)  $\frac{k}{5} = -16$

5)  $23 = n + 7$

6)  $2 = 14 + x$

7)  $r - 1 = -1$

8)  $m - 19 = -15$

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9)  $-24 = x - 11$

10)  $160 = 10n$

11)  $-9v - 7 = -169$

12)  $15 = -10b - 5$

13)  $54 = -6 + 10x$

14)  $-8 - 2n = 22$

15)  $-4 = \frac{v}{6} - 3$

16)  $-5 = \frac{a}{3} - 7$

17)  $-5k + 6 = -24$

18)  $4 + \frac{n}{5} = 6$

19)  $-7 = \frac{x}{7} - 9$

20)  $10 = 9 + \frac{n}{6}$

**#2 Multi-step equations, combining like terms and distributive property (all whole numbers)**

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1. Anything on the \_\_\_\_\_ you can just add/subtract together. This is called \_\_\_\_\_.
  2. To move something to the other side, you must do the \_\_\_\_\_.

**Level 1: Just Combine Like Terms First**

21)  $-5r - 4r = -18$

22)  $24 = 6b - 3b$

23)  $7x + 8 - 8x = 0$

24)  $-24 = -3n - 5n$

25)  $-v + 2v = 2$

26)  $4 - 7a - 8 = -11$

**Level 2: Distribute once and then combine like terms.**

27)  $-24 = -8x + 4(x - 7)$

28)  $-79 = 1 + 5(2x - 6)$

29)  $-6 - 3(1 + 2k) = 33$

30)  $5 = -5(n + 2)$

31)  $-78 = 6(1 + 2p)$

32)  $4(5x + 8) = 32$

**Level 3: Distribute twice and then combine like terms.**

33)  $-24 = 8(8n + 8) - 8(n + 4)$

34)  $5(m + 1) - 2(m - 6) = 32$

35)  $55 = -5(r + 1) - 5(-5 - 8r)$

36)  $-3(1 + 5x) - 3(8x + 8) = 12$

37)  $-42 = -2(b + 8) - 6(5b - 1)$

38)  $72 = 2(-6 - 2n) - 2(8n + 8)$

**#3 Equations with variables on both sides, combining like terms and distributive property**

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Since these equations have variables on  
\_\_\_\_\_ SIDES, it is even more important  
to follow our “Hokey Pokey” steps!

**Get your variables here**  
**Put your constants here**  
**Do the opposite operation**  
**Just to keep things fair**  
**Subtract and Add first**  
**Till they're all on their own side**  
**Then it's time to divide!**

**Before you get too crazy**  
**Draw you fence as a line**  
**Separating the equation**  
**By the equals sign**  
**Check for distribution**  
**And then you can combine**  
**Like terms on the same side!**

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**Level 1: Just Combine Like Terms First**

39)  $14 - x = -5x + 6x$

40)  $15 - 7v = v + 7$

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41)  $a - 2 + 6 = -14 + 7a$

42)  $7 + 4n = 9 - 2n + 4n$

43)  $-4p - 6 - 8 + 6 = p - 3$

44)  $-8k + k = 3 - 6k$

**Level 2: Distribute once and then combine like terms.**

45)  $2(1 - 3n) = -26 + 8n$

46)  $5(1 - 3x) = 23 - 6x$

47)  $-m - 36 = 7(3m + 4) - 6m$

48)  $4(6r + 5) = 20 + 7r$

49)  $-37 + 7n = 7 - 3(-4n + 8)$

50)  $-7x - 36 = -6(-4x + 6)$

**Level 3: Distribute twice and then combine like terms.**

51)  $-4(r + 6) = -4(-4 - 4r)$

52)  $3(8b - 4) - 8(2 + 3b) = -7b + 3b$

53)  $-4(7 - 8x) - 4 = 5(6 - 6x)$

54)  $-4(n - 3) = -8(n + 4)$

55)  $-2(4 + 3v) = -8 - (v + 5)$

56)  $6(-7a + 5) = 6(5 + 3a) + 6a$

**#4 Equations with special solutions – identities and no solutions**

a. Solve  $10 - 8a = 2(5 - 4a)$ .

$$10 - 8a = 2(5 - 4a)$$

$$10 - 8a = 10 - 8a$$

$$10 - 8a + 8a = 10 - 8a + 8a$$

$$10 = 10$$

Use the Distributive Property.

Add  $8a$  to each side.

Always true!

This equation is true for every value of  $a$ , so the equation is an identity.

b. Solve  $6m - 5 = 7m + 7 - m$ .

$$6m - 5 = 7m + 7 - m$$

$$6m - 5 = 6m + 7$$

$$6m - 5 - 6m = 6m + 7 - 6m$$

$$-5 = 7$$

Combine like terms.

Subtract  $6m$  from each side.

Not true for any value for  $m$ !

This equation has no solution.

If you end up with a false statement, such as \_\_\_\_\_ or \_\_\_\_\_ your solution is “\_\_\_\_\_”

If you end up with a true statement, such as \_\_\_\_\_ or \_\_\_\_\_ your solution is “\_\_\_\_\_” or “\_\_\_\_\_”

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57)  $1 + 3x - 7 = 3x - 3$

58)  $3 + 3 + x - 3 = 3 - 5x + 6x$

59)  $2x + 6 = 6 + 2x$

60)  $x - 7 - x = -8x + 8x - 7$

61)  $-7(v + 2) = -7v - 13$

62)  $-13 + 3n = 3(n - 5)$

63)  $-(-6m + 5) = 6m - 5$

64)  $5(k - 4) = -25 + 5k$

65)  $7 - 5(7 - r) = -2r + 7(r - 2)$

66)  $-(1 + 3x) = -3x - 1$

67)  $4 + 6(-4 - 4b) = 29 - 24b$

68)  $8(v - 2) = -4(4 - 2v)$