

# WS "Introduction to Supplemental Lesson 3"

Use the Distributive Property to eliminate the parentheses.  
Simplify when possible.

1)  $-4(3n - 2)$

2)  $-6(-8 - 7h)$

3)  $2(-p + 4)$

4)  $-9(5m + 5)$

5)  $7(-3 - 2y)$

6)  $-12(-4j + 6)$

7)  $5(6r - 1)$

8)  $-9(7w - 3)$


9)  $-15(4 - 2a)$

10)  $8(-6 - 6z)$

Lesson 1-8 (pg 53-56)

## Properties Answer Key

**D**istributive



**S**hare

$$c(b+g) = cb+cg$$

$$3(4+8) = 3 \cdot 4 + 3 \cdot 8$$

$2(8 + 4) = 2(8) + 2(\underline{4})$   
 $2(8 - 4) = 2(8) - \underline{2}(4)$

### Properties Song

**C**ommutative, Commutative changes up the order.

**A**ssociative, Associative changes up the border!

**I**ntity, Identity will always be the same.

**D**istributive will share with all so no one is to blame!

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## WS "Stilwell Study Guide Supplemental Lesson 3"

**Then, simplify each expression by combining like terms.**

1)  $-60 + 30a + 30 + 50a$

2)  $-2p + 8 - 7p - 4$

3)  $-64t + 8 - 18 + 4t + t$

4)  $6m - 9 - 45m - 45 + m$

5)  $9 + 21w + 28 + 40 - 40w$

6)  $5 - 15y - 6y - 30 + 25$

7)  $-36 - 4g + 5g + 35g + 49$

8)  $-2 - 16q + 100 + 60q$

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**Use the Distributive Property to eliminate the parentheses.**

**Then, simplify each expression by combining like terms.**

9)  $8 + 7(-3 - 2y) - 8y + 6$

10)  $-2w + 10(1 + 4w) - 2(-15w + 6)$

11)  $-9(7w - 3) + 49 + 7w$

12)  $7n - 4(3n - 2) + 9$

13)  $3h - 8 - 2h - 4(2h - 2)$

14)  $-5 + 3h - 6(-8 - 7h)$

15)  $8(-6 - 6z) + 25(2 + 3z)$

16)  $5(6r - 1) - 4(-2r + 8)$

17)  $6(-e - 4) - 3(8e - 8)$

18)  $-4(-2k + 6) + 9(10 - k)$

# Study Guide Supplemental Lesson 3

## Solving Multi-Step Equations

**Solve Equations with Grouping Symbols** Equations with grouping symbols can be solved by first using the Distributive Property to remove the grouping symbols.

**Example 1** Solve  $2(6m - 3) + 4 = 8m - 10$ .

$$12m - 6 + 4 = 8m - 10$$

Use the Distributive Property.

$$12m - 2 = 8m - 10$$

Combine like terms in EACH expression.

$$\begin{array}{r} -8m \\ \hline 4m - 2 = \end{array} \quad \begin{array}{r} -8m \\ \hline -10 \end{array}$$

Get rid of the smallest algebraic term.

$$\begin{array}{r} 4m - 2 = \quad -10 \\ \quad +2 \quad \quad +2 \\ \hline 4m \quad \quad = \quad -8 \end{array}$$

“Unwrap” the variable by going backwards

$$\begin{array}{r} 4m \\ \hline 4 \end{array} = \begin{array}{r} -8 \\ \hline 4 \end{array}$$

in the order of operations!

$$\frac{4m}{4} = \frac{-8}{4}$$

$$m = -2$$

### Exercises

Solve each equation. Show your work on a piece of loose leaf ☺

1.  $8(g - 3) = 24$     2.  $5(x + 3) = 25$     3.  $7(2c - 5) = 7$     4.  $2(8d + 7) = -5 + 6d$

5.  $5(s + 2) = 2(s + 11)$     6.  $7y - 1 = 2(y + 3) - 2$     7.  $2(f + 3) - 2 = 10 + 2f$

8.  $5(x - 2) + 13 = 2x + 9$     9.  $5(b - 1) = 1 + 2(b + 6)$     10.  $3(x + 3) = 2x - 5$

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## Skills Practice Supplemental Lesson 3

**Solve each equation. Show all work!**

1)  $2(g - 7) = 16$

2)  $5(x + 2) = 30$

3)  $3(2d + 7) = 39$

4)  $4(a - 2) = 3(a + 4)$

5)  $13 + 5f = 3(f + 2) + 9$

6)  $3(1 + x) = 2(x - 4)$

7)  $4(n + 2) - n = 2n + 5$

8)  $4(x + 3) = x$

9)  $2(c - 3) = 76$

10)  $7(x - 2) = 5(x + 2)$

11)  $2(6x + 1) = 4(x - 5) - 2$

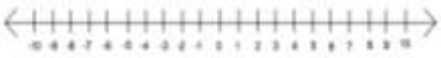

12)  $4(2b + 6) - 11 = -5b - 13$

13)  $8 + 8(2t - 1) = 36 + 12t$

14)  $9t - 21 = 3(t - 7)$

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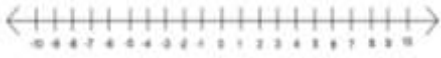
**Solve and graph each inequality. Show all work!**

15)  $3x + 9 < 18$   16)  $5 + 2c < -9$  

17)  $4x - 3 < 2 - x$   18)  $3(n + 2) < 24$  

19)  $3(2 - b) \geq 11 + 2b$   20)  $\frac{m}{3} + 5 \geq 2$  

21)  $\frac{1}{2}(8 - x) > 6$   22)  $\frac{c}{4} + 7 \geq 5$  

23)  $5y + 1 > y - 3$   24)  $20 - 2n > 26$  

25)  $\frac{1}{3}(x - 6) < 2$   26)  $5 - 2k \leq 15$  

27)  $-2(3 + t) < -8$   28)  $\frac{n}{4} - 9 > 5$  

# Study Guide Supplemental Lesson 3 (page 2)

## Solving Multi-Step Inequalities

**Solve Multi-Step Inequalities** Some inequalities require more than one step to solve. For such inequalities, undo the operations in reverse order, just as in solving multi-step equations. Remember to reverse the inequality symbol when multiplying or dividing each side of the inequality by a negative number. If the inequality contains parentheses, use the Distributive Property to begin simplifying the inequality.

### Example

Solve  $12 - 2x > 24 + 2x$ . Graph the solution on a number line.

Check #1: Do I need to distribute?

Check #2: Do I need to combine like terms in each expression?

Check #3: Do I need to get rid of the smallest algebraic term?

$$12 - 2x > 24 + 2x$$

Get rid of the smallest algebraic term.

$$\begin{array}{r} +2x \quad +2x \\ \hline 12 - 2x > 24 + 2x \\ \hline 12 > 24 + 4x \end{array}$$

“Unwrap” the variable by going backwards in the order of operations!

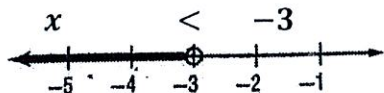
$$\begin{array}{r} -24 \quad -24 \\ \hline 12 > 24 + 4x \\ \hline -12 > 4x \end{array}$$

Check: Does the inequality sign need to flip?

$$\begin{array}{r} -12 > 4x \\ \hline -3 > x \end{array}$$

Remember: It's easiest to graph the inequality with the variable on the left!

$$x < -3$$

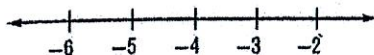


### Exercises

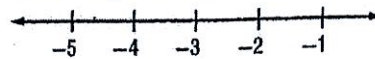
Solve each inequality. Show your work on a piece of loose leaf. ☺

Then, graph the solution on the given number line.

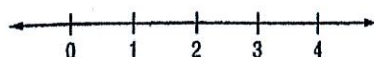
1.  $5c + 9 < -11$



2.  $8 - 4p > 20$



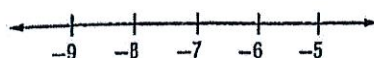
3.  $4c - 1 \geq c + 5$



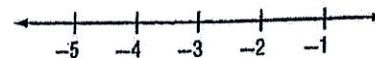
4.  $18 - 2n \geq 6$



5.  $3(d + 2) < -15$



6.  $\frac{b}{3} + 9 > 8$



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# Supplemental Unit (part 2) Bringing It All Together #1

## Multi-Step Equations and Inequalities

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**Simplify each expression. (Use the Distributive Property and collect like terms.)**

1)  $5(8g + 10)$

2)  $-3(7m + 4)$

3)  $9(10f - 7)$

4)  $-(7a - 1)$

5)  $-4(-3k + 6) + (-12)$

6)  $6(4n - 2) - 5$

7)  $6c + 3(2c - 4) + 8$

8)  $2(-2p + 1) - 5p - 4$

9)  $5 + 3(-3 - 4y) - 7y + 4$

10)  $-8(-7w - 2) + 6(5 + w)$

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**Solve each equation. Show your work ☺ Check your solution if necessary.**

11)  $6k + 14 = 4k - 4$

12)  $-14 = -3(2p + 4)$

13)  $5y - 1 = 3(y + 2) + 3$

14)  $1 + 5(b + 3) = 8(b + 2)$

**OVER** 

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Solve each equation. Show your work ☺ Check your solution if necessary.

15)  $6f - 4 = 2(f + 8)$

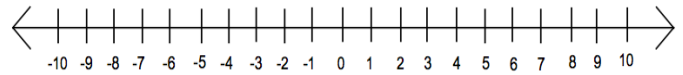
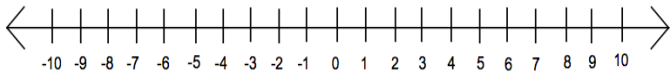
16)  $6 - 2c + 3 = 7 + c$

Solve. Show your work ☺ Check your solution if necessary.

Then, graph the solution on a number line.

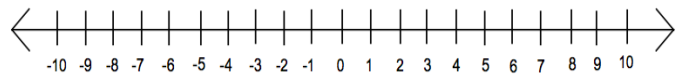
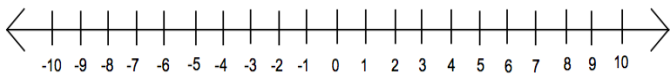
17)  $6w - 2 \geq -20$

18)  $3 - 3k \leq -12$



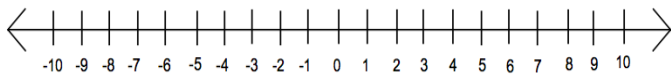
19)  $\frac{m}{2} - 6 < -5$

20)  $4h - 4 \leq 1 - h$



21)  $-3(n + 2) > -18$

22)  $\frac{1}{3}(12 + 6b) > 8$



**FINALLY DONE**

