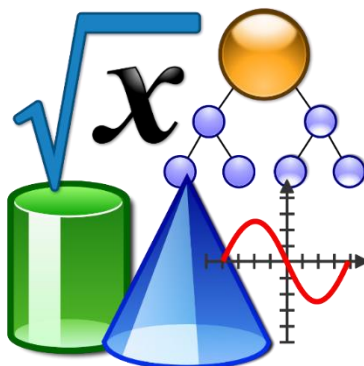


# NPS Learning in Place

## Pre-algebra 6/7 and Math 8



Name: \_\_\_\_\_ School: \_\_\_\_\_ Teacher: \_\_\_\_\_

April 27- May 15

<b>Week 1</b>	<ul style="list-style-type: none"><li>• Evaluating Expressions</li></ul>
<b>Week 2</b>	<ul style="list-style-type: none"><li>• Solving equations</li></ul>
<b>Week 3</b>	<ul style="list-style-type: none"><li>• Solving Inequalities</li></ul>

# Week 1

## Order of Operations and Evaluating Expressions

**8.14a The student will evaluate an algebraic expression for given replacement values of the variables.**

**Expressions are simplified using the order of operations.**

**The order of operations is as follows:**

- First, complete all operations within grouping symbols\*. If there are grouping symbols within other grouping symbols, do the innermost operation first.
- Second, evaluate all exponential expressions.
- Third, multiply and/or divide in order from left to right.
- Fourth, add and/or subtract in order from left to right.

\*Parentheses ( ), brackets [ ], braces { }, absolute value

(i.e.,  $-7$ ), and the division bar (i.e.,  $\div$ ) should be treated as grouping symbols.

**Algebraic expressions are evaluated by substituting numbers for variables and applying the order of operations to simplify the resulting numeric expression.**

Simplify  $3x - 4(r + 3)^3$ , when  $x = 3$  and  $r = -1$

$$3(3) - 4(-1 + 3)^3$$

$$3(3) - 4(2)^3$$

$$3(3) - 4(8)$$

$$9 - 4(8)$$

$$9 - 32$$

$$-23$$

**Directions: Evaluate the expressions below. Show your work!**

1) $\frac{16}{n} + 2^3 - 10$ when $n = 8$	2) $r^5 - 12 \div r$ when $r = 3$	3) $b + 6 \div 4$ when $b = 1.5$
4) $3r^2 - 17$ when $r = 6$	5) $27 - \frac{24}{b}$ when $b = 8$	6) $\frac{9}{10} \cdot y - \frac{3}{10}$ when $y = \frac{1}{2}$

Check your work: 1) 0    2) 239    3) 3    4) 91    5) 24    6)  $\frac{3}{20}$  or 0.15

**8.14a The student will evaluate an algebraic expression for given replacement values of the variables.**

**Evaluating Expressions**

**\*Parentheses ( ), brackets [ ], braces { }, absolute value (i.e., - 7), and the division bar (i.e., ) should be treated as grouping symbols.**

$$\begin{aligned} & \frac{2z^3 - 18}{1 + s^2 - 8} \text{ when } z = 5 \text{ and } s = 6 \\ &= \frac{2 \cdot 5^3 - 18}{1 + 6^2 - 8} \\ &= \frac{2 \cdot 125 - 18}{36 - 8} \\ &= \frac{250 - 18}{28} \\ &= \frac{232}{28} \\ &= 8 \end{aligned}$$

**Directions: Evaluate each expression.**

1)  $\frac{9 \cdot 2}{4 + x^2 - 1}$  when  $x = 3$

2)  $\frac{13y - 4}{18 - y^2 + 1}$  when  $y = 4$

3)  $\frac{|2x - y|}{\sqrt{5x + 2y}}$   
when  $x = 20$  and  $y = -6$

- 4) What is the value of  $4n(n \div 2)^3$  when  $n = -8$ ?
- A. -2048
  - B. -384
  - C. 384
  - D. 2048

- 5) What is the value of  $p\sqrt{q-r}$  when  $p = 3$ ,  $q = 17$ , and  $r = 8$ ?
- A. 3
  - B. 9
  - C. 15
  - D. 27

- 6) What is the value of  $\frac{(k+4)^2 - 1}{k+7}$  when  $k = -2$ ?
- A. -7
  - B.  $\frac{1}{3}$
  - C.  $\frac{3}{5}$
  - D. 7

## ERROR ANALYSIS

James evaluated the following algebraic expression.

$$\frac{|2x - y|}{\sqrt{5x + 2y}} \text{ when } x = 5 \text{ and } y = -2$$

His work is shown here.

$$\begin{aligned} & \frac{|2x - y|}{\sqrt{5x + 2y}} \\ & \frac{|2(5) - (-2)|}{\sqrt{5(5) + 2(-2)}} \\ & \frac{|2(5) - 2|}{\sqrt{5(5) + 2(-2)}} \\ & \frac{|10 - 2|}{\sqrt{5(5) + 2(-2)}} \\ & \frac{|8|}{\sqrt{5(5) + 2(-2)}} \\ & \frac{8}{\sqrt{5(5) + 2(-2)}} \\ & \frac{8}{\sqrt{25 + 2(-2)}} \\ & \frac{8}{5 + 2(-2)} \\ & \frac{8}{5 + (-4)} \\ & \frac{8}{1} = 8 \end{aligned}$$

**Math Journal:** James made a mistake while evaluating this expression. Identify his mistake and rework the problem to obtain the correct answer.

## Exit Ticket

Name \_\_\_\_\_ Date \_\_\_\_\_

1. Jill needs to find the area of a triangle. If the base of the triangle is  $4\frac{1}{2}$  feet and the height is  $8\frac{1}{4}$  feet, what is the area of the triangle? ( $A = \frac{1}{2}bh$ ) Show all work.

2. Explain what is similar and what is different about the two expressions  $3x^2$  and  $(3x)^2$ , when  $x = \frac{1}{3}$ .

## Combining Like Terms Vocabulary

**Terms-** Quantities that you ADD to form an algebraic expression are called terms.

**Like Terms-** terms with the same variable raised to the same power You CAN add/subtract like terms.

**You can COMBINE Like Terms \*\*COMBINE means add, so use the addition rules**

**Unlike Terms-** terms whose variables are not the same, or who have the same variable, but it's raised to a different power

**You CANNOT add/subtract unlike terms.**

**Variable** A symbol used to represent an unknown amount. The symbol is usually a letter of the alphabet.

**Coefficient** The number being multiplied by a variable. It is the number attached to the variable and is usually in front.

**\*Special note! A variable with no coefficient has an "INVISIBLE 1" attached to it! Constant A number that doesn't change. There is no variable attached to a constant.**

**Algebraic Expression** An expression that contains variables

Expression	$6a + 3$	$6a - 3$	$2x + 4 - 5z$
Number of terms	2	2	3
Coefficient(s)	6	6	2, 5
Constant (s)	3	-3	4

**Directions: Identify the number of terms, the coefficients, and the constant term of the expressions below.**

1)  $7p - 6pc + 3c - 2$

Number of terms: \_\_\_\_\_  
 Coefficients: \_\_\_\_\_  
 Constant terms: \_\_\_\_\_

2)  $8 + 4ab - 5b$

Number of terms: \_\_\_\_\_  
 Coefficients: \_\_\_\_\_  
 Constant terms: \_\_\_\_\_

3)  $0.2x - y + 8z$

Number of terms: \_\_\_\_\_  
 Coefficients: \_\_\_\_\_  
 Constant terms: \_\_\_\_\_

**To simplify by combining like terms:**

1. Search for like terms (same variable raised to the same power; and constants with other constants).
2. Identify variable terms and constant terms.
3. Combine the like variable terms. \*Remember that an “invisible 1” lurks in front of variables that appear to have no coefficient attached to them.
4. Continue with other like terms.

Variable Expressions <b>Circle</b> the variable terms <b>Box</b> the constant terms. *Remember the signs	Combine the like variable terms:	Combine like constant terms:	Combine the like and variable terms: Final Answer
1) $4x + 5x + 7 + x - 2$ $\textcircled{4x} + \textcircled{5x} + \boxed{7} + \textcircled{x} - \boxed{2}$	$4x + 5x + 1x$  $10x$	$7 - 2$  $5$	$4x + 5x + 1x + 7 - 2$  $10x + 5$
2) $2n + 3 - 5n + 6$			
3) $-8 + 2d - 7 - 5d + 12$			
4) $5b + 7 - 3b - 4$			

**Math Journal:** Sarah was asked to simplify the variable expression:  $4 + n + 7n + 5$ . Her answer was  $7n + 9$ . Is she correct? Explain.

Check your work: 2)  $-3n + 9$     3)  $-3d - 3$     4)  $3b + 3$

8.14b The student will simplify algebraic expressions in one variable.

Simplifying Algebraic Expressions

The Distributive Property Guide Notes

DISTRIBUTIVE PROPERTY

For any numbers  $a$ ,  $b$ , and  $c$ , the product of  $a$  and  $(b + c)$  is:

$$a(b + c) = ab + ac$$

$$(b + c)a = ba + ca$$

For any numbers  $a$ ,  $b$ , and  $c$ , the product of  $a$  and  $(b - c)$  is:

$$a(b - c) = ab - ac$$

$$(b - c)a = ba - ca$$

a.  $4(n + 5)$

$$\begin{aligned} 4(n + 5) &= 4(n) + 4(5) \\ &= 4n + 20 \end{aligned}$$

Distributive Property  
Multiply.

b.  $12(y - 3)$

$$\begin{aligned} 12(y - 3) &= 12(y) - 12(3) \\ &= 12y - 36 \end{aligned}$$

Distributive Property  
Multiply.

**LIKE TERMS** are terms that contain the same variables, with corresponding variables having the same power.

**SIMPLIFYING EXPRESSIONS:**

Distributive property is used to combine like terms by adding their coefficients. A simplified expression must not have grouping symbols and fractions are reduced to its lowest term.

Directions: Use the Distributive Property to simplify the expressions.

2)  $7(a + 2)$

2)  $6(b - 7)$

3)  $-3(d - 11)$

4)  $-10(9 + b)$

5)  $18(w + 5)$

6)  $8(12 + a)$

7) **ERROR ANALYSIS** Describe and correct the error in rewriting the expression.

$$6(y + 8) = 6y + 8$$



## Simplifying Algebraic Expressions- Combining Like Terms

- Simplifying an algebraic expression means to write the expression as a more compact and equivalent expression. This usually involves combining like terms.
- Like terms are terms that have the same variables and exponents. The coefficients do not need to match (e.g.,  $12x$  and  $-5x$ ;  $45$  and  $-523$ ;  $9y$ ,  $-51y$  and  $49y$ .)
- Like terms may be added or subtracted using the distributive and other properties.

For example:

$$2(x - 12) + 5x$$

$$2x - 12 + 5x$$

$$2x + 5x - 12$$

$$7x - 12$$

**Directions: Simplify each expression.**

1)  $-6k + 7k$

2)  $12r - 8 - 12$

4)  $n - 10 + 9n - 3$

4)  $-4x - 10x$

5)  $-r - 10r$

6)  $-2x + 11 + 6x$

Check your answers: 1)  $k$

2)  $12r - 20$

3)  $10n - 13$

4)  $-14x$

5)  $-11r$

6)  $4x + 11$

## Simplifying Expressions – Combining Like Terms

### Vocabulary Review:

**Term:** parts of an algebraic expression separated by an addition or subtraction sign

**Coefficient:** the numerical factor of a term that contains a variable

**Constant:** A term without a variable

**Like Terms:** terms that contain the same variables

**To simplify an algebraic expression with one variable: Use the properties of operations to write an equivalent expression that has no like terms or parentheses.**

**Example #1: Simplify the expression:  $7x + 3 + 9x + 15$**

$$\begin{aligned} &7x + 3 + 9x + 15 \\ &= 7x + 9x + 3 + 15 && \text{Use Commutative Property to change the order of the terms} \\ &= 16x + 18 && \text{Evaluate by combining like terms} \\ &= 16x + 18 && \text{Final Answer} \end{aligned}$$

**Example #2: Simplify the expression:  $4(m + 3) + 2m$**

$$\begin{aligned} &4(m + 3) + 2m \\ &= 4m + 12 + 2m && \text{Use Distributive Property to eliminate parentheses} \\ &= 4m + 2m + 12 && \text{Use Commutative Property to re-order the terms} \\ &= 6m + 12 && \text{Combine like terms to get final answer} \end{aligned}$$

**The Properties of Operations can also be used to simplify expressions with more than one variable.**

**Example #3: Simplify the expression:  $(7x + y) + 15x (7x + y) + 15x$**

$$\begin{aligned} &= (y + 7x) + 15x && \text{Use Commutative Property to re-order the terms} \\ &= y + (7x + 15x) && \text{Use Associative Property to re-group} \\ &= y + 22x && \text{Combine like terms to get final answer} \end{aligned}$$

**Example #4: Simplify the Expression:  $9(m + 3k) 9(m + 3k)$**

$$\begin{aligned} &= 9 \cdot m + 9 \cdot 3k && \text{Use Distributive Property to eliminate parentheses} \\ &= 9m + 27k && \text{Evaluate to get final answer} \end{aligned}$$

**Directions:** Simplify the expressions.

1)  $7h + 5g + 3h + 2h$

2)  $15g + (11g + 7k)$

2)  $4(2x + 5y) - 2y$

4)  $7 - 3(9x + p)$

5)  $-2(-3k + 4) - 7$

6)  $3n + 3(1 + 8n)$

7)  $-3(5 + 2x) - 7$

8)  $-1 + 3(m + 4)$

**Assessment Questions:**

Simplify the expressions given below.

$-3x + 2w + 5w - 4x - 3 + 9x$	$6s + 2s - 16 - 19s + 18 + 15s$	$22x - 16x + \frac{1}{4} - 10x - \frac{5}{8} + 10x$

Apply the properties of real numbers to simplify the expressions given below.

**Math Journal:** How is *simplifying* an expression different from *evaluating* an expression? How are they alike?

## Week 2

### Focus: Solve and check multi-step equations with one variable

- The equal sign indicates that the two sides of the equation are equal.
- Performing the exact same operations on both sides of the equation (Addition, Subtraction, Multiplication, and Division Properties of Equality) maintains that equality.
  - Don't forget to combine like terms first!
- When presented with a model of an equation (for example, algebra tiles), the solution can be found using the model, or the model can be used to create the equation.

**Example 1:** Solve  $3w + 15 - 5 + 2w = 5$

$$3w + 15 - 5 + 2w = 5$$

$$5w + 10 = 5$$

$$5w + 10 - 10 = 5 - 10$$

$$5w + 0 = -5$$

$$5w = -5$$

$$\frac{5w}{5} = \frac{-5}{5}$$

$$1w = -1$$

$$w = -1$$

**Check :**  $3w + 15 - 5 + 2w = 5$

$$3(-1) + 15 - 5 + 2(-1) = 5$$

$$-3 + 15 - 5 - 2 = 5$$

$$12 - 5 - 2 = 5$$

$$7 - 2 = 5$$

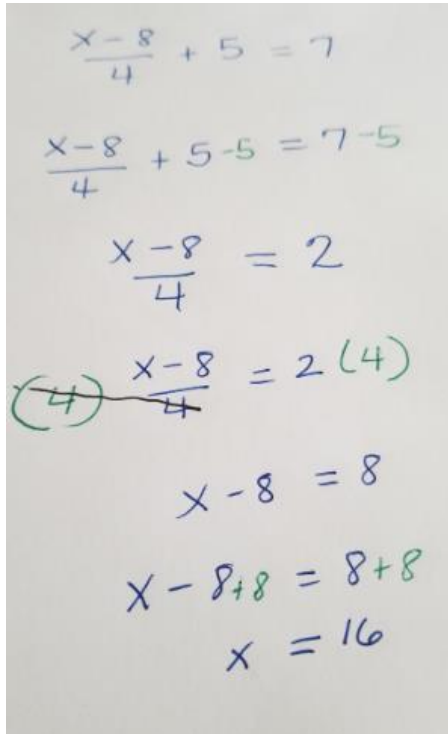
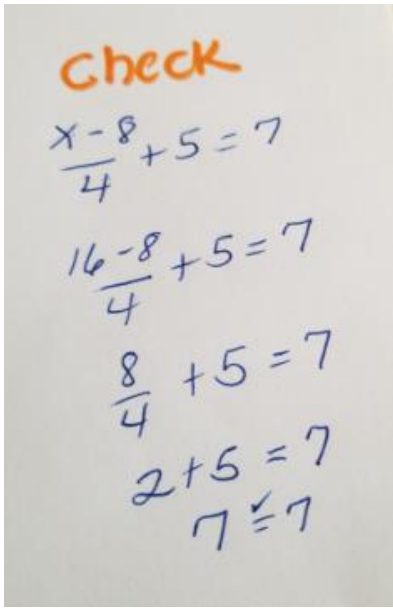
$$5 = 5$$

Equation	Check	Equation	Check
$2y + 2y + 6 + 10 = 18$		$3 - 2x + 4x + 6 = 9$	
Equation	Check	Equation	Check
$4 + 3h - h = 2 + 10$		$5x + 8x - 2 = 10$	

<b>Equation</b> $4y - 8 + 6y = -4$	<b>Check</b>	<b>Equation</b> $8y + 2y - 6 = 10$	<b>Check</b>
<b>Equation</b> $-15 + 3x - 7x = -43$	<b>Check</b>	<b>Equation</b> $-x + 8 - 9x = 11$	<b>Check</b>
<b>Equation</b> $6x - 5 + 7x = 34$	<b>Check</b>	<b>Equation</b> $2x + 5x + 6.3 = -14.4$	<b>Check</b>
<b>Equation</b> $-15 + 3x - 7x = -43$	<b>Check</b>	<b>Equation</b> $2x + 5x + 6.3 = 14.4$	<b>Check</b>

## Focus: Solving Multi-Step Equation involving Distributive Property

### Don't Call Me After Midnight

<b>1<sup>st</sup> D</b>	<b>Distributive Property</b>
<b>2<sup>nd</sup> C</b>	<b>Combine Like Terms</b>
<b>3<sup>rd</sup> M</b> a. A b. M	<b>Move Variable to One side</b> a. Addition/Subtraction b. Multiplication/Division
<b>3<sup>rd</sup></b> <b>*Exception</b>	<div style="text-align: center; margin-bottom: 10px;"> <math display="block">\frac{x-8}{4} + 5 = 7</math> </div> <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p><b>WORK</b></p>  </div> <div style="width: 45%;"> <p><b>check</b></p>  </div> </div>

Equation	Check	Equation	Check
$8x - 27 - 6x - 10 = 15$		$4(x + 7) - 8 = -12$	

Equation	Check	Equation	Check
$-13 = 5(1 + 4m) - 2m$		$37 = -3 + 5(x + 6)$	
$3x + 2(x - 5) = 35$		$0.25(3 + a) = 0.5$	
$3(y - 1) = -2(y + 3) + 13$		$\frac{5(y+3)}{9} = 40$	

## Focus: Verbal translations of expressions and equations

The table below lists some key words and phrases that are used to describe common mathematical operations. To write algebraic expressions and equations, assign a variable to represent the unknown number. In the table below, the letter "x" is used to represent the unknown. In translation problems, the words **sum**, **total**, **difference**, **product** and **quotient** imply at least two parts – use parentheses when a **sum** or **difference** is multiplied. For example, the phrase "the sum of three times a number and five" translates to "3x + 5," while the phrase "three times the sum of a number and five" translates to "3(x + 5)."

OPERATION	KEY WORD/PHRASE	EXAMPLE	TRANSLATION
Addition (+)	plus	A number plus three	$x + 3$
	more than	Ten more than a number	$x + 10$
	the sum of	The sum of a number and five	$x + 5$
	the total of	The total of six and some number	$6 + x$
	increased by	A number increased by two	$x + 2$
	added to	Eleven added to a number	$x + 11$
Subtraction (-)	minus	A number minus seven	$x - 7$
	less than	Four less than a number	$x - 4$
	the difference of	The difference of a number and three	$x - 3$
	less	Nine less a number	$9 - x$
	decreased by	A number decreased by twelve	$x - 12$
	subtracted from	Six subtracted from a number	$x - 6$
Multiplication (x)	times	Eight times a number	$8x$
	the product of	The product of fourteen and a number	$14x$
	twice; double	Twice a number; double a number	$2x$
	multiplied by	A number multiplied by negative six	$-6x$
	of	Three fourths of a number	$\frac{3}{4}x$
Division (÷)	the quotient of	The quotient of a number and seven	$\frac{x}{7}$
	divided by	Ten divided by a number	$\frac{10}{x}$
	the ratio of	The ratio of a number to fifteen	$\frac{x}{15}$
Powers ( $x^n$ )	the square of; squared	The square of a number; a number squared	$x^2$
	the cube of; cubed	The cube of a number; a number cubed	$x^3$
Equals (=)	equals	Seven less than a number equals ten.	$x - 7 = 10$
	is	Three times a number is negative six.	$3x = -6$
	is the same as	Eight is the same as twice a number.	$8 = 2x$
	yields	Twelve added to a number yields five.	$x + 12 = 5$
	amounts to	Nine less a number amounts to twenty.	$9 - x = 20$

Verbal	Algebraic	Verbal	Algebraic
Twice the difference between 6 times h and 3 is 30.		Seven is the sum of 5 times z and 4 divided by two.	

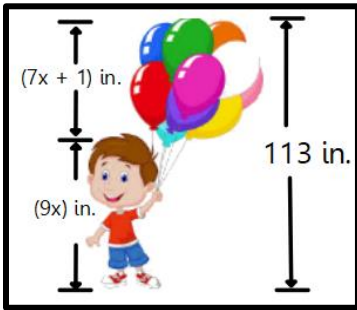


<b>Algebraic</b>	<b>Verbal</b>	<b>Algebraic</b>	<b>Verbal</b>
$14 = 4 + \frac{h}{3}$		$5(x + 8) = 10$	
<b>Verbal</b>	<b>Algebraic</b>	<b>Verbal</b>	<b>Algebraic</b>
Three-fourths of x added to twice of x is 11		The product of 4 and the difference of x and 3 is 54.	
<b>Algebraic</b>	<b>Verbal</b>	<b>Algebraic</b>	<b>Verbal</b>
$\frac{4 - k}{-3} = 45$		$5h - 10 = 3h$	
<b>Verbal</b>	<b>Algebraic</b>	<b>Verbal</b>	<b>Algebraic</b>
Nine less than a number is the product of four and twelve.		The sum of 8 and 5 is equal to the difference of number and 7.	
<b>Algebraic</b>	<b>Verbal</b>	<b>Algebraic</b>	<b>Verbal</b>
$\frac{1}{8}y + 4$		$n + (n + 1) = 35$	
<b>Verbal</b>	<b>Algebraic</b>	<b>Verbal</b>	<b>Algebraic</b>
Three times the x difference of a number and 12		Two fifths of a number is the same as seven.	

## Focus: Multistep Equations and Word Problems

Use what you know about verbal translations and solving equations to solve word problems.

**Example 1:** Find the height of the boy shown in the picture.



$$7x + 1 + 9x = 113$$

$$16x + 1 = 113$$

$$16x + 1 - 1 = 113 - 1$$

$$16x = 112$$

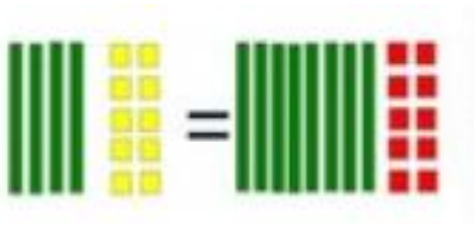
$$\frac{16x}{16} = \frac{112}{16}$$

$$x = 7$$

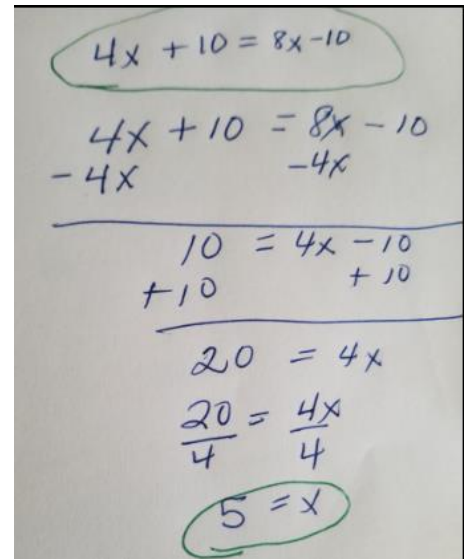
he boy's height is  $9(7) = 63$  in.

**Example 2:**

Use the following model to write and solve the represented equation.



Key			
x	1	-x	-1



### Word Problem

Kylie paid a total of \$300 to exercise at a gym. The initial membership fee was \$75. Her gym dues were \$25 a month. How many months did Kylie go to the gym?

### Work and Solution

Timothy spent a total of \$68 at Macys. His purchase included a pair of jeans at \$32 and 2 t-shirts at \$x each. How much did Timothy pay for one t-shirt? Write an equation that best represents this problem.

Use the following model to write and solve the represented equation.



Key	
	= x
	= -x
	= 1
	= -1

## TYING SOL 8.17 ALL TOGETHER!

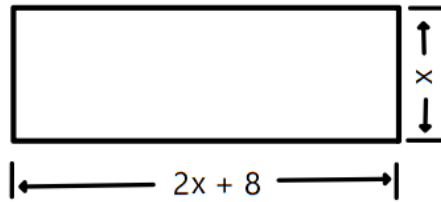
1). What value of  $x$  makes this equation true?  $x - 7 = \frac{3}{4}x - 5$

- A.  $x = -48$       B.  $x = 1$       C.  $x = \frac{1}{2}$       D.  $x = 8$

2). What value of  $x$  makes this equation true?  $\frac{2x+3}{4} = -x+3$

- A.  $\frac{3}{2}$       B.  $-\frac{3}{2}$       C.  $\frac{9}{2}$       D.  $-\frac{9}{2}$

3). The length and width of the rectangle are noted in the image. If the perimeter of the rectangle is 82 square units, find the length and width of the rectangle.



4). What value of  $g$  makes this equation true?  $\frac{2}{3}(6g - 3) = 3(g + 1)$

- A. 1      B. 4      C. 5      D. 6

5). Solve.  $3m = 5m - 10$

- A. -5      B.  $-\frac{5}{4}$       C.  $\frac{5}{4}$       D. 5

6). Find the value of  $x$  that makes the equation true.

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<b>Key:</b>	
<b>-x</b>	<b>-1</b>
<b>x</b>	<b>1</b>

- A.  $x = 1$     B.  $x = -1$     C.  $x = 2$     D.  $x = -2$

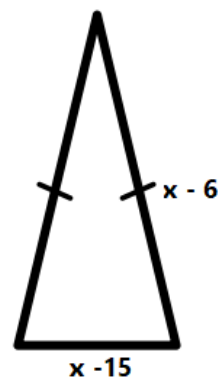
7). Five times sum of a number,  $x$ , and nine is ten. What is the number?

- A.  $-41$       B.  $45$       C.  $11$       D.  $-7$

8). George has  $(-2x + 5)$  dollars. Evan has  $(6x + 77)$  dollars. George and Evan have the same amount of money. How much do they each have?

9). An isosceles triangle has a perimeter of 30 units. What is the value of  $x$ ?

- A.  $-23$       B.  $19$       C.  $25.5$       D.  $22.5$



10). What is the solution to the equation?  $1.5x + 12 = 0.75(4x - 12)$

- A.  $14$       B.  $4.\bar{6}$       C.  $-42$       D.  $22$





## 8.18 Solving Multi-Step Inequalities

**To solve an inequality use the following steps:**

- \*1 Eliminate all fractions by multiplying all terms by the least common denominator of all fractions
- \*2 Distribute
- \*3 Combine like terms
- \*4 Move variable to one side using inverse operations
- \*5 Add or subtract on both sides
- \*6 Divide or multiply on both sides
- \*7 If the coefficient is negative---FLIP the inequality symbol  
---AND---

If the variable is on the right---FLIP the inequality symbol and move to the left

### Graphing Symbols and Phrases

Symbol	Meaning	Number Line	Example
$\geq$	Less than or equal to "At most" "Is no more than"		$x \leq 5$ $2x \leq 15$
$<$	Less than "Is less than" "Is fewer than"		$x < 5$ $2x < 15$
$\leq$	Greater than or equal to "At least" "Is no less than"		$x \geq 5$ $2x \geq 5$
$>$	Greater than "Is greater than" "Is more than"		$x > 5$ $2x > 5$

# Reteach

## Graph Inequalities

An **inequality** is a mathematical sentence that contains  $<$  or  $>$ . When used to compare a variable and a number, inequalities can describe a range of values. Some inequalities use the symbols  $\leq$  or  $\geq$ . The symbols  $\leq$  is read *is less than or equal to*. The symbol  $\geq$  is read *is greater than or equal to*.

**Examples** Write an inequality for each sentence.

- 1 Shipping is free on orders of more than \$100.

Let  $c$  represent the cost of the order.

$$c > 100$$

- 2 The restaurant seats a maximum of 150 guests.

Let  $g$  represent the number of guests.

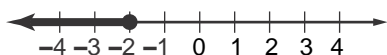
$$g \leq 150$$

Inequalities can be graphed on a number line. An open or closed dot is used to indicate where they begin. An arrow to the left or to the right is used to show that they continue in the indicated direction. An open circle is used with inequalities having  $<$  or  $>$ . A closed circle is used with inequalities having  $\leq$  or  $\geq$ .

**Examples** Graph each inequality on a number line.

3  $d \leq -2$

Place a closed dot at  $-2$ . Then draw a line and an arrow to the left.



4  $d > -2$

Place an open dot at  $-2$ . Then draw a line and an arrow to the right.



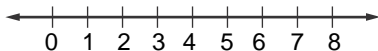
### Exercises

Write an inequality for each sentence.

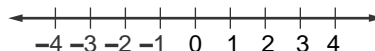
1. Our delivery time is guaranteed to be less than 30 minutes.
2. Your speed must be at least 45 miles per hour on the highway.

Graph each inequality on a number line.

3.  $r > 7$



4.  $x \leq -1$



## It's the Inequalities Matching Game!

Directions: Pair the inequality to its matching number line. Do not use lines. Put the letter of the correct number line on the blank next to the inequality.

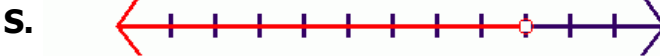
\_\_\_\_\_ 1.  $x > 4$



\_\_\_\_\_ 2.  $x \geq -2$



\_\_\_\_\_ 3.  $x > 3$



\_\_\_\_\_ 4.  $x \leq 2$



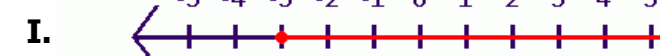
\_\_\_\_\_ 5.  $x \geq 4$



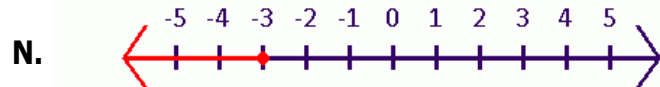
\_\_\_\_\_ 6.  $x \geq -3$



\_\_\_\_\_ 7.  $x < -2$



\_\_\_\_\_ 8.  $x \leq -3$



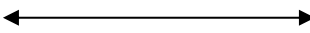
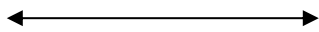
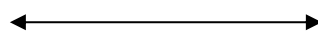
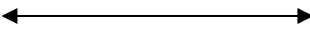
When completed correctly, your solution (from top to bottom) should spell a word that means **a mathematical statement that says two expressions are equal.**

\_\_\_\_\_

## Error Analysis

Name \_\_\_\_\_ Date \_\_\_\_\_

**Directions:** Identify the mistake in the first column and then correct it in the second column. Once you make the correction and show the appropriate work, graph your solution. **THERE IS AN ERROR IN EACH PROBLEM.**

Inequality	Correction	Graph
$6x - 4 > -2$ $\underline{\quad +2 \quad +2}$ $6x > -2$ $x > -\frac{1}{3}$		
$-x - 6 \leq 2 - (3x - 4)$ $-x - 6 \leq 2 - 3x + 4$ $-x - 6 \leq 6 - 3x$ $\underline{\quad +x \quad +x}$ $-6 \leq 6 - 2x$ $\underline{\quad -6 \quad -6}$ $0 \leq -2x$ $0 \geq x$		
$2(x - 4) - 7x < 37$ $2x - 8 - 7x < 37$ $\underline{\quad +7x \quad +7x}$ $9x - 8 < 37$ $\quad +8 < 45$ $9x < 45$ $x < 5$		
$2x - 6 \geq 8 + 4x$ $\underline{\quad -4x \quad -4x}$ $-2x - 6 \geq 8$ $\underline{\quad +6 \quad +6}$ $-2x \geq 14$ $x \geq -7$		



## Inequality Solitaire-Part 1

\*Solve each inequality below by showing your work in each box

#1	$38 > 2(x + 8)$	#2	$-3(2x - 1) \leq x - 18$
#3	$-(4x - 5) + 16x \geq -31$	#4	$3(-5 - x) + x < -10 - x$
#5	$-7x - 11x > 26 - x + 9x$	#6	$25 - 2x \leq 5(2 - x)$
#7	$x - 32 \geq 32 + 9x$	#8	$-3x + 51 > 13 + 7x - 22$

Time to check your answers — Complete Inequality Solitaire Part 2

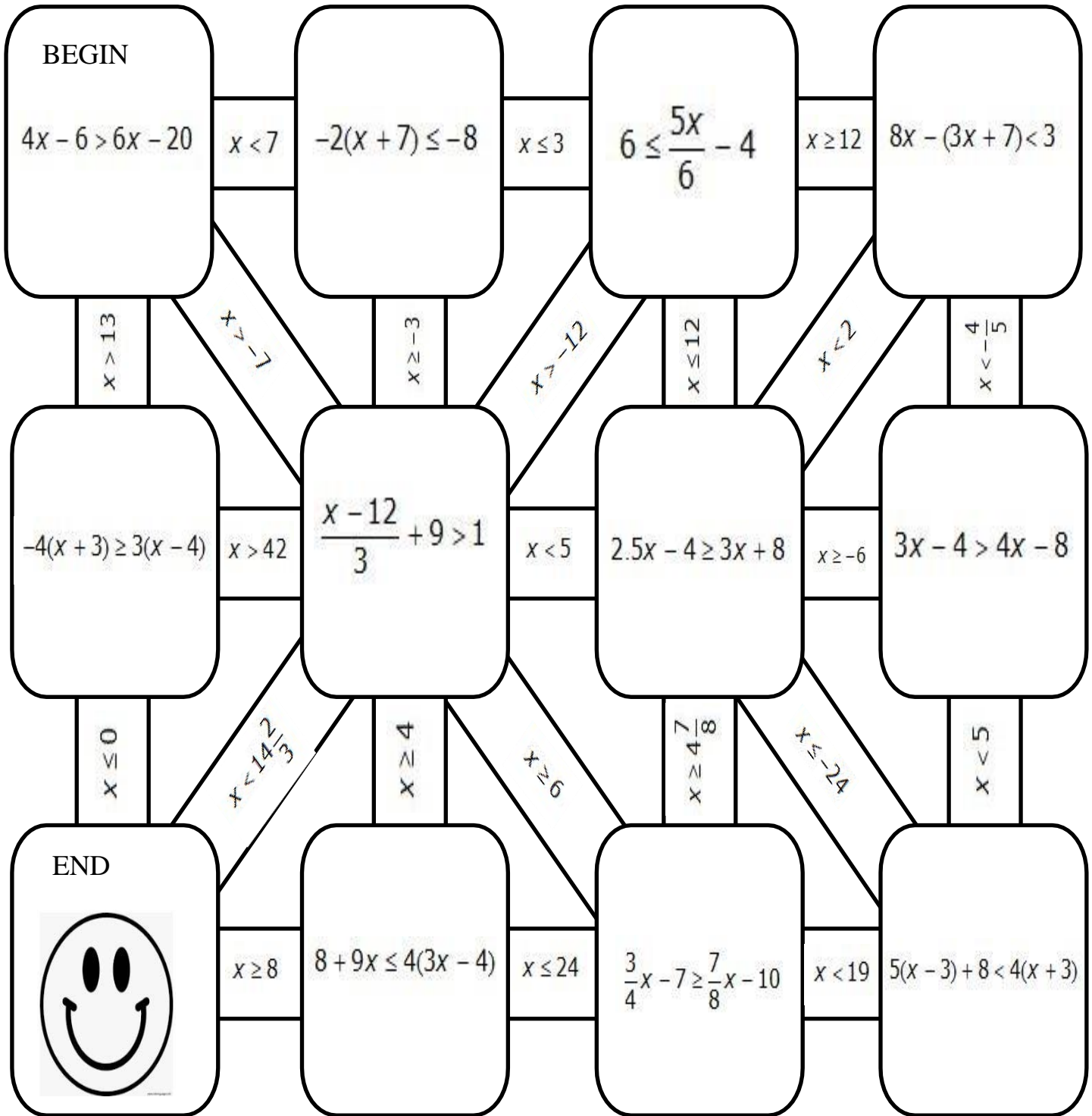
## Inequality Solitaire-Part 2

\*Solve each inequality below by showing your work in each box

When completed correctly each answer should match the number from Part 1

#1	$35 > -5(4 - x)$	#2	$-(x - 26) \leq x - 4(1 - 2x)$
#3	$-(4x - 15) \geq -9(3 + 2x)$	#4	$21 + x > 2(-2 - 5x) + 6x$
#5	$7(x + 1) - 7x < 1 - 6x$	#6	$-2(x - 20) \leq 10 - 10(1 + x)$
#7	$-2(9 + 4x) \geq -x + 6 - 4x$	#8	$9x - 1 + 11x < 7(11 + x)$

# Solving Inequalities MAZE



**Start at Begin. Complete problems to work through the maze to End. Show your work in the boxes on the next page.**

**Solving Inequalities Maze –Show your work**