Name _____

MODULE 12

Expressions and Equations

Standard 6.EE.5 *Understand solving an equation or inequality as a process of answering a* question: which values from specified set, if any, make the equation or inequality true? Use substitution to determine whether a given number in a specified set makes an equation or inequality

Standard 6.EE.7 *Solve real-world and mathematical problems by writing and solving equations of the form x+p=q and px=q for cases in which p, q and x are all nonnegative rational numbers.*

Standard 6.EE.8 *Write an inequality of the form x > c or x < c to represent a constraint or condition in a real-world or mathematical problem. Recognize that inequalities of the form x> c or x<c have infinitely many solutions; represents solutions of such inequalities on number line diagrams.*

In Module 12, you will learn how to…

- **____ 12-1 → Write equations and determine whether a number is a solution of an equation. (6.EE.5, 6.EE.6, 6.EE.7)**
- **____ 12-2 → Solve addition and subtraction equations. (6.EE.5, 6.EE.7)**
- **____ 12-3 → Solve multiplication and division equations. (6.EE.5, 6.EE.7)**
- **____ 12-4 → Write and graph inequalities to represent situations. (6.EE.5, 6.EE.8)**
- **____ 12-5 → Write and graph inequalities to represent situations. (6.EE.5, 6.EE.8)**

Your Grade for Module 12 (6.EE.5, 6.EE.7, & 6.EE.8)

The skills and concepts that you learn in this packet will appear as your grade for 6.NS.B Number Fluency.

A = 4 EXCEEDS	You exceed the learning targets in understanding or application.
B = 3 MEETS	You have met all the learning targets for this standard.
C = 2 DEVELOPING	You are approaching the standards or have only partial understanding.
D = 1 WELL BELOW	You have not yet met many of the standards.

Name _____

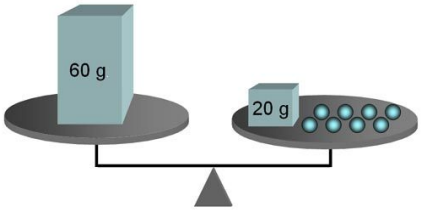
6.EE.5, 6.EE.6, 6.EE.7 Lesson 12-1

Writing Equations to Represent Situations

Learning Target: *I can write equations and determine whether a number is a solution of an equation.*

Do Now

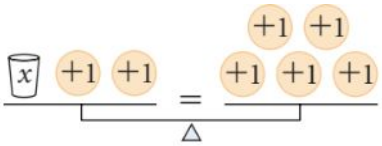
1. How much does each marble *m* weigh?



60 = 20 + 8m

m=_____

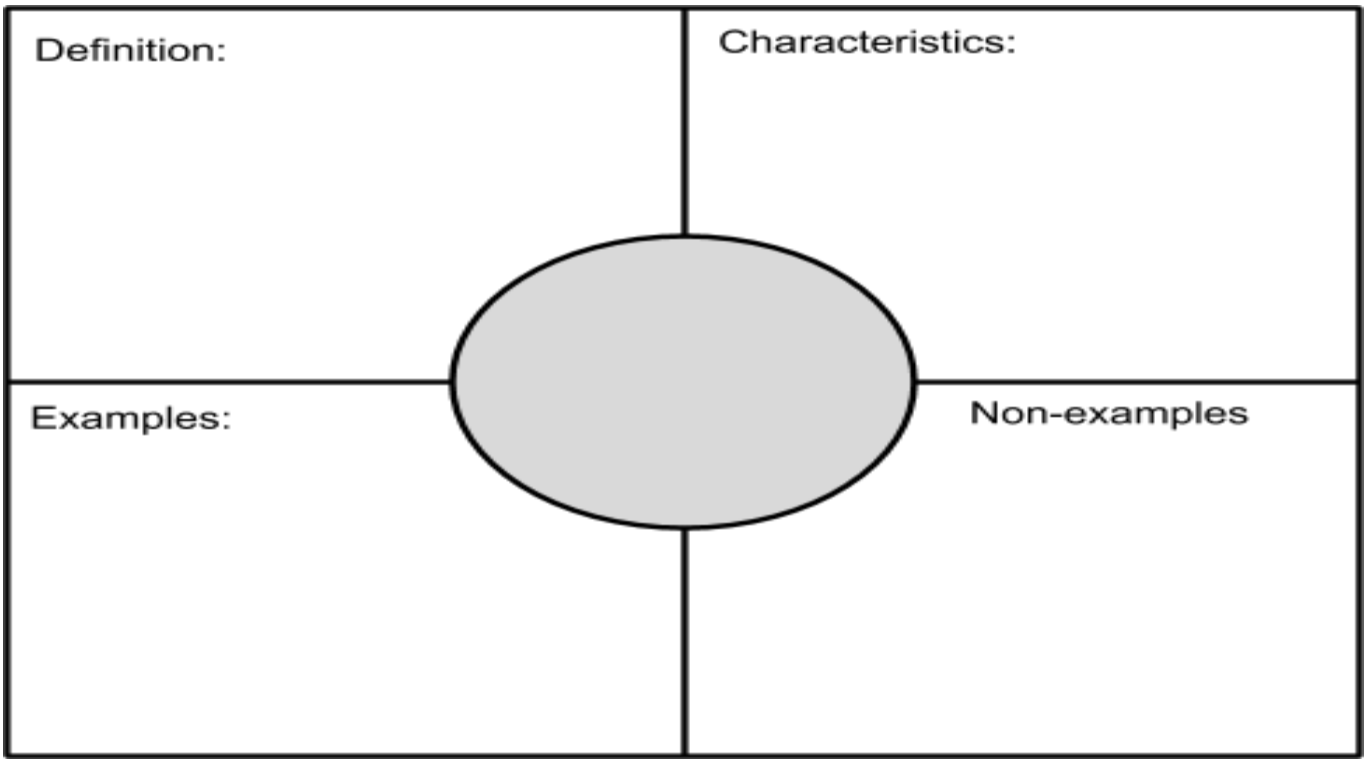
2. What is x equal to?



x + 2 = 5

x=_____

Key Vocabulary



Opening

	Expression	Equation
Numerical	$5 + 4$	$5 + 4 = 9$
Words		
Algebraic	$n + 4$	$n + 4 = 9$
Words (Algebraic)		

- **An expression represents a relationship between two values**
- **An equation relates two expressions using symbols for is or equals.**

Example 1- Determine whether the given value is a solution of the equation.

Recall that an <u>algebraic expression</u> contains one or more variables. In an algebraic expression, you can substitute a number for a variable and then simplify to find the value of the expression.

In an equation, two expressions equal each other. Determine whether substituting the given value for each variable makes each equation true. (When a numerical value makes the equation true, we say that it is a <u>solution</u> of the equation.)

A. $x + 9 = 15;\ \ x = 6$

$\square + 9 = 15$

$15 = 15$ ✔

6 is a solution of $x + 9 = 15$

B. $\frac{y}{4} = 32\ ;\ y = 8$

$\frac{\square}{4} = 32$

$__ = 32$

8 _____ *a solution of the equation* $\frac{y}{4} = 32$

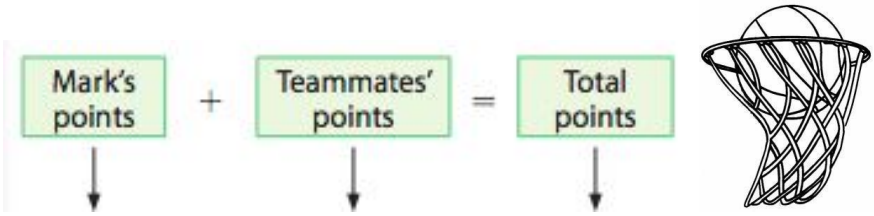
Exercise 1- Determine whether the given value is a solution of the equation. <u>Show your work</u>. Then, circle "solution" or "not a solution" to state whether the given value is a solution to the equation.

1. 11 = n + 6; n = 5 **CIRCLE ONE: Solution Not a solution**	**2. y - 6 = 24; y = 18** **CIRCLE ONE: Solution Not a solution**

3. 14 + x = 46 ; x = 32 **CIRCLE ONE: Solution Not a solution**	**4. 17y = 85 ; y = 5** **CIRCLE ONE: Solution Not a solution**
5. $\frac{x}{9}$ = 4; x = 36 **CIRCLE ONE: Solution Not a solution**	**6. 15 t = 100; t = 6** **CIRCLE ONE: Solution Not a solution**

Example 2- Writing equations to represent situations.

Mark Scored 17 points for the home team in a basketball game. His teammates as a group scored *p* points. Write an equation to represent this situation.



_____ + _____ = _____

Exercise 2

Write an equation to represent each situation.

1. Eli has a fish tank that contains 38 fish. There are 9 goldfish and f other fish. **f represents _____** **Equation:**	**2. Shelby has 102 beads to make n necklaces. Each necklaces will have 17 beads.** **n represents _____** **Equation:**

3. Mikel is m years old. His 9-year old sister Kaitlyn is three years younger than Mikel. **m represents _____** **Equation:**	**4. Aryah rented skates for h hours. The rental fee was $2 per hour and she paid a total of $8.** **$h$ represents _____** **Equation:**

Example 3-Writing an equation and checking solutions

You can substitute a given value for the variable in a real-world equation to check if that value makes sense for the solution.

Payton used a gift card to buy $47 worth of groceries. Now she has $18 left on her gift card. Write an equation to represent this situation. Use your equation to determine whether Payton had $65 or $59 on the gift card before buying groceries.

Step 1: Write a word equation based on the situation

	—		=	

Step 2: Rewrite the equation using a variable for the unknown quantity and the given values for the known quantities.

Let x be the _____

	—		=	

Step 3: Substitute 65 and 59 for x to see which equation is true.

The amount on Payton's gift card before she bought groceries was $_____.

Reflect:
Suppose Payton has $12 left on her gift card. How would this change the equation and the final answer?

_____

_____

_____

Exercise 3- Writing an Equation and Checking Solutions

1. On Saturday morning, Owen had $24. By the end of the afternoon he had earned a total of $62. Write an equation to represent the amount of money *m* Owen earned on Saturday afternoon. Then, determine whether Owen earned $38 or $31 on Saturday afternoon by substituting these values for your variable in the equation.

Equation: _____

On Saturday afternoon, Owen earned:
CIRCLE ONE: $38 $31

2. Suki paid $132 for 6 DVD's. Write an equation to determine *c,* the cost of each DVD. Then substitute these values for your variable in the equation to determine whether each DVD costs $17 or $22.

Equation:_____

The cost of each DVD is:
CIRCLE ONE: $17 $22

Problem Set

Determine whether the given value is a solution by substitution.

1. $23 = x - 9; x = 14$ Solution? Yes or No	**2.** $\frac{n}{13} = 4; n = 52$ Solution? Yes or No	**3.** $14 + x = 46; x = 32$ Solution? Yes or No
4. $17y = 85; y = 5$ Solution? Yes or No	**5.** $25 = \frac{k}{5}; k = 5$ Solution? Yes or No	**6.** $2.5n = 45; n = 18$ Solution? Yes or No

7. Each floor of a hotel has r rooms. On 8 floors, there are a total of 256 rooms. Write an equation to represent this situation.

Word Equation: **Equation:** _____

_____ × _____ = _____

8. In the school band, there are 5 trumpet players and f flute players. There are twice as many flute players as there are trumpet players. Write an equation to represent this situation.

Equation:_____

9. Andy is one-fourth as old as his grandfather, who is 76 years old. Write an equation to represent this situation.

Equation_____

10. Isaac bought 8 tickets to a baseball game. He paid a total of $208. Write an equation to determine whether each t ticket cost $26 or $28.

Equation_____

Substitute $26 and $28 for t to see which equation is true.	

11. The high temperature was 92℉. This was 24℉ higher than the overnight low temperature, *t*. Write an equation to determine whether the low temperature was 62℉ OR 68℉.

Equation:_____

Substitute 62℉ and 68℉ for t to see which equation is true.	

Homework for Lesson 12-1

For problems 1-4, determine whether the given value is a solution of the equation.

1. $21 = m + 9,\ m = 11$	**2.** $21 - h = 15;\ h = 6$
3. $5q = 31;\ q = 13$	**4.** $\frac{y}{12} = 2;\ y = 24$

For problems 5-8, write an equation to represent each situation.

5. Ruben and Tariq have 245 downloaded minutes of music. If Ruben has 132 minutes, and Tariq has q minutes, write and solve an equation to represent how many minutes Tariq has. **Equation: _____**	6. Sarah and her friends went to jewelry store to buy matching bracelets. If they bought a total of 7 bracelets that cost d dollars each and paid a total of $84, write and solve an equation to represent how much one of the bracelets cost. **Equation: _____**
7. Bethany bought c pieces of Valentines day candy that she gave out to her 5 friends. If she gave each friend 3 pieces, write and solve an equation to find how many pieces of candy Bethany started with. **Equation: _____**	8. Georgia's height is 4 inches less than Sienna's height. If Georgia is 58 inches tall and Sienna is s inches tall, write and solve an equation to find Sienna's height. **Equation: _____**

9. A. The table shows the ages of Cindy and her dad.

Dad's Age	Cindy's Age
28 years old	2 years old
36 years old	10 years old
?	18 years old

a. **Write an equation that relates Cindy's age to her dad's age when Cindy is 18. Tell what the variable represents.**

Equation_____

Variable reprsents_____

b. **Determine if 42 is a solution to the equation. Show your work.**

C. Explain the meaning of your answer in part b. Use complete sentences.

_____

_____

Spiral Review

1. Write an equivalent expression. $8(x - 2a^3) + 4a^3$	**2. Complete and SOLVE. 40% of 5 is what number?** $\frac{\square}{100} = \frac{\square}{\square}$
3. Brenda can deliver 644 newspapers in 7 hours. How many can she deliver in 9 hours?	**4. A car drives 500 miles in 8 hours. What is its speed per hour (UNIT RATE)?**

Name_____

6.EE.5, 6.EE.7 Lesson 12-2

Solving Addition & Subtraction Equations

Learning Target: I can solve real-world and mathematical problems by writing and solving equations.

Do Now

Given the equation below, how would you solve this to find the unknown value of *x*?

$$8 + x = 10$$

_____

_____

Explore Activity: Modeling Equations

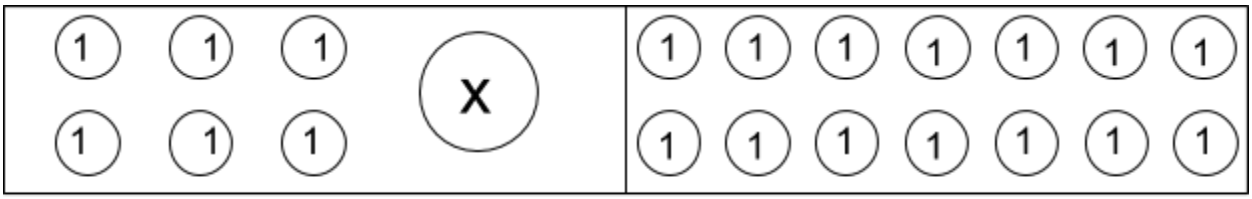
A puppy weighed 6 ounces at birth. After two weeks, the puppy weighed 14 ounces. How much weight did the puppy gain?

Let x represent the number of ounces gained.

a) Weight at birth:_____ b) Weight gained:_____ c) Weight after 2 weeks:_____

Write an equation to represent this situation:

Algebra tiles can model some equations. An equation mat represents the two sides of an equation. To solve the equation, remove the same number of tiles from both sides of the mat until the x tile is by itself on one side.



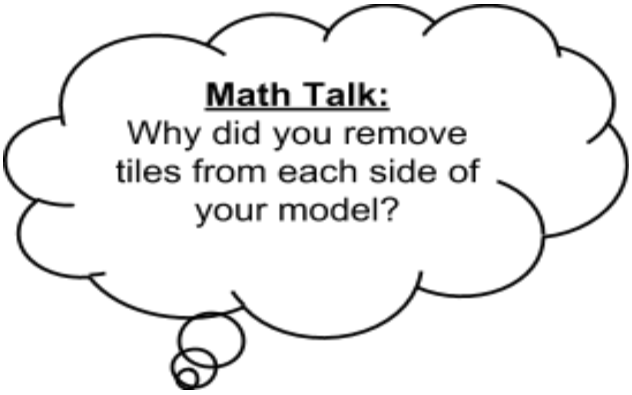
_____ _____

A) How many 1 tiles must you remove on the left side so that the x tile is by itself? Cross out these tiles on the equation mat. _____

B) Whenever you remove tiles from one side of the mat, you must remove the same number of tiles from the other side of the mat! Cross out the tiles on the other side of the equation.

C) How many tiles remain on the right side of the mat?

So the puppy gained _____ ounces.



_____

_____

_____

How do you know when the model shows the final solution? How do you read the solution?

_____

_____

_____

In this scenario, is there more than one possible answer to how much weight the puppy gained? Explain how you know.

_____

_____

_____

Example 1 → Using Subtraction to Solve Equations

Subtraction Property of Equality

You can subtract the same number from both sides of an equation and the the two sides will remain equal.

When an equation contains _____, solve by

_____ the same number on _____ _____.

a + 15 = 26

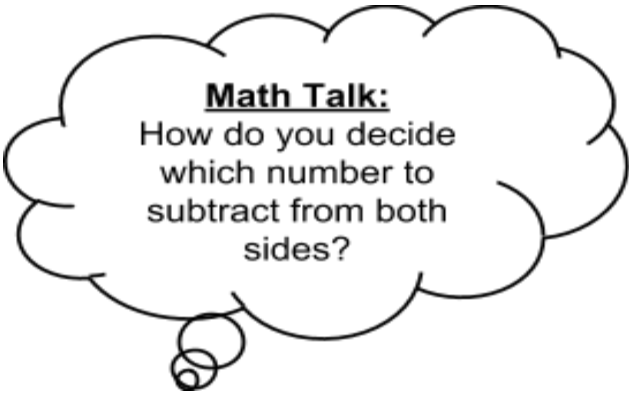
a) What operation is required on the left side of the equation? _____

b) What is the inverse operation? _____

c) What you do on one side must be done on the other side. What operation is required on the right side of the equation? _____

Solve:	**Check using substitution:** a = _____ _____ + 15 = 26 _____ = 26 **Are the values the same on each side of the equation?** YES! OR OOPS!

Graph the solution on a number line:



_____

_____

_____

Exercise 1

Solve:

f + 9 = 20

_____

f =

Check using substitution:

f = _____

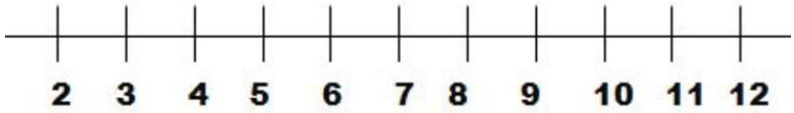
_____ + 9 = 20

_____ = 20

Are the values the same on each side of the equation?

YES! OR No, try again!

Graph the solution on a number line:



Solve:

5 = w + 1.5

_____

= w

Check using substitution:

w = _____

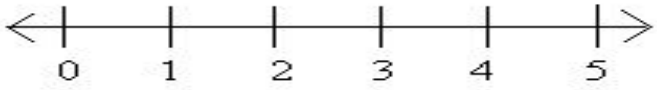
5 = _____ + 1.5

5 = _____

Are the values the same on each side of the equation?

YES! OR No, try again!

Graph the solution on a number line:



Example 2 → Using Addition to Solve Equations

Addition Property of Equality

You can add the same number to both sides of an equation and the two sides will remain equal.

When an equations contains _____, solve by

_____ the same number on _____ _____.

Alexandra withdrew $225 from her bank account. After her withdrawal, there was $548 left in her account. How much money did Alexandra have in her account before the withdrawal?

Let x represent the amount Alexandrea had in her account before the withdrawal.

a) Amount Alexandra withdrew:_____

b) Amount left after withdrawal:_____

c) Amount before the withdrawal:_____

Write an equation to represent this situation:

Solve:	**Check using substitution:** **Are the values the same on each side of the equation?** YES! OR No, try again!

Exercise 2

3) Ronald spent $123 on school clothes. He counted his money and found that he had $36 left. How much money did he originally have?

Write an equation to represent this situation:

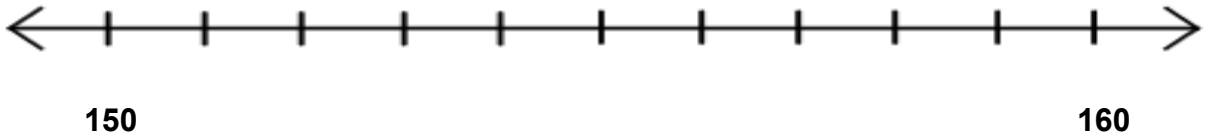
Solve:

Check using substitution:

Are the values the same on each side of the equation?

YES! OR No, try again!

Graph the solution on the number line:



4) Solve:

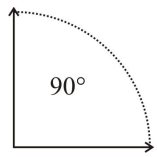
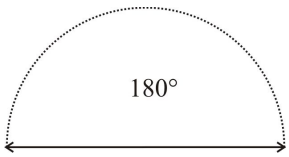
h - 0.50 = 0.75

Check using substitution:

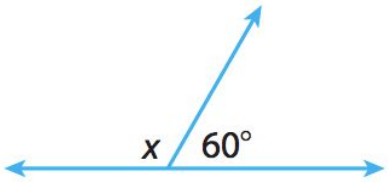
5) Solve: 67 = w - 32	**Check using substitution:**

Example 3 → Solving Equations that Represent Geometric Concepts
You can write equations to represent geometric relationships.

Review:

	
_____ angle	_____angle
How many right angles is equivalent to 180◦? _____	

The sum of an unknown angle and a $60\circ$ angle is $180\circ$. What is the measure of the unknown angle?

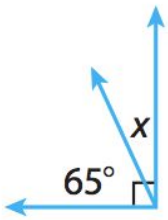


Write an equation that represents this geometric relationship:

Solve for the degree of the unknown angle.

Check using substitution.

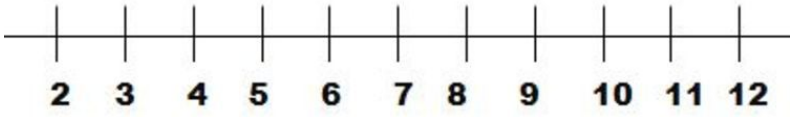
Exercise 3

Write and solve an equation to find the measure of the unknown angle. 	**Check using substitution:**

Problem Set

1) A total of 14 guests attended a birthday party. 3 friends stayed after the party to help clean up.

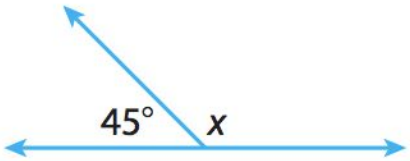
Write an equation to show how many guests left when the party ended:

Solve:	**Check using substitution:** **Are the values the same on each side of the equation?** YES! OR No, try again!
Graph the solution on the number line: 	

Solve equations using addition or subtraction

2) $h - 6.9 = 11.4$ h = _____	**3)** $82 + p = 122$ p = _____
4) $n + \frac{1}{2} = \frac{7}{4}$ n = _____	**5)** $\$77.45 = x - \$6.90$ x = _____

6) Write and solve an equation to find the measure of the unknown angle (Example 3).



Solve:	**Check using substitution:** **Are the values the same on each side of the equation?** YES! OR No, try again!

For problems 7 & 8: Write an equation, solve, and check using substitution.

7) My sister is 14 years old. My brother says that his age minus 12 is equal to my sister's age.

Let x represent my brother's age. Write an equation that shows how to solve for my brother's age.

Equation:_____

Solve:	**Check using substitution:** **Are the values the same on each side of the equation?** YES! OR No, try again!

8) Kim bought a poster that cost $8.95 and some colored pencils. The total cost was $21.35. Write an equation to represent how much Kim paid for colored pencils.

9) A bakery sold 100 baked goods this Friday.

Baked Good	# Sold
Doughnuts	62
Cookies	

Write an equation to represent how many cookies were sold on Friday.

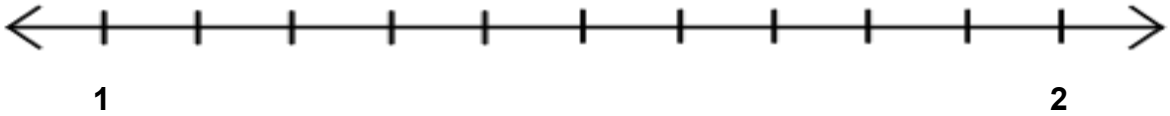
Name:_____ Date:_____ Class:_____

Homework 12-2

1)

Solve:	**Check using substitution:**
s + 12.5 = 14	

Graph the solution on the number line:



2) Acme Car Company sold 37 vehicles in June. How many compact cars were sold in June?

Acme Car Company – June Sales	
Type of car	**Number sold**
SUV	8
Compact	?

Write an equation to represent the situation, solve, and then check using substitution.

3) Sandra wants to buy a new iPod that is on sale for $95. She has already saved $73. How much more money does she need?

Write an equation to represent the situation, solve, and then check using substitution.

Spiral Review

1) What is 30% of 60?	2) Evaluate $9x - x^3$; when x = 3
3. A bag of gummy bears weighs 50 grams and each gummy bear weighs 2.5 grams. How many gummy bears are in the bag?	4. Put in order from greatest to least -4 -4.1 3 0.05 $-\frac{3}{4}$ 7 2.3 _____
5. Simplify the expression $9 + x + 5y + 3(2y + y^2)$	6. $\frac{3}{5}$ _____ 0.07 (>, <, =)

Name_____

6.EE.5, 6.EE.7 Lesson 12-3

Solving Multiplication and Division Equations

Learning Target: I can solve real-world and mathematical problems by writing and solving equations using inverse operations.

Do Now

Paula solved the equation $7 + x = 10$ and got 17, but she is not certain if she got the correct answer. How could you explain Paula's mistake to her?

_____

_____

_____

Explore Activity

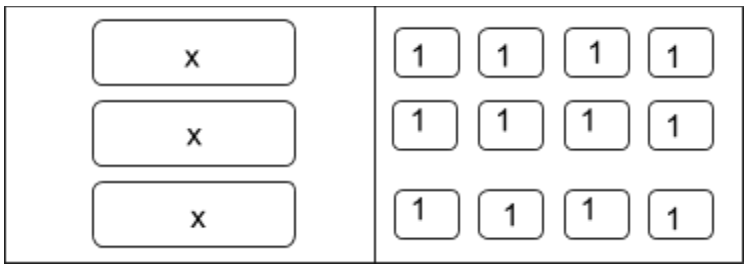
Diana has a cookie recipe that requires 12 eggs to make 3 batches of cookies. How many eggs are needed per batch of cookies?

Let x represent the number of eggs needed per batch.

a) Number of batches:_____ b) Number of eggs per batch:_____ c) Total eggs:_____

Write an equation to represents this situation:

Use an equation mat to model the equation.



_____ _____

A) There are 3 x tiles, so draw circles to separate the tiles into 3 equal groups.

B) How many 1 tiles are in each group? _____

C) How many eggs are needed per batch of cookies? _____

Example 1 → Using Division to Solve Equations

Division Property of Equality

You can divide both sides of an equation by the same nonzero number, and the two sides will remain equal.

When an equations contains _____, solve by

_____both sides of the _____ by the same _____number.

A hot air balloon flew at 8 miles per hour. How many hours did the balloon travel after 72 miles?

$$8x = 72$$

d) What operation is required on the left side of the equation? _____

e) What is the inverse operation? _____

f) What you do on one side must be done on the other side. What operation is required on the right side of the equation? _____

Solve:	**Check using substitution:** **Are the values the same on each side of the equation?** YES! OR No, try again!

Exercise 1

Solve & Check:	**Solve & Check:**
$9a = 54$	$18 = 6p$

Example 2 → Using Multiplication to Solve Equations

Multiplication Property of Equality

You can multiply both sides of an equation by the same number, and the two sides will remain equal.

When an equations contains _____, solve by

_____ both sides of the_____ by the _____

_____.

John is scrapbooking. He usually completes about 9 pages per hour. One night last week he completed pages 23 through 47 in 2.5 hours. Did he work at his average rate?

How many hours did John work for? _____

Starting page:_____ Ending page:_____

Scrapbooking rate:_____

Write and solve an equation to represent this situation:	**Check using substitution:**
	Are the values the same on each side of the equation? OR

	YES! No, try again!

How many pages can John expect to complete?

Did John work at her average rate of 9 pages per hour? Explain why or why not.

Caroline ran 15 miles in 5 days. She ran the same distance each day. How many miles did she run each day?

Write an equation to show how many miles Caroline ran each day

Solve:

Check Using Substitution:

Exercise 2

1) Stan bought 8 fish which cost f dollars each. If his total came out to be $72, how much did each fish cost? (Write an equation, solve, and then check using substitution)

2) Solve and check: $\frac{x}{5} = 10$	**3) Solve and check:** $15 = \frac{x}{2}$

Problem Set

For problems 1-4, solve and then check using substitution.

1) $12p = 144$	**2)** $\frac{x}{5} = 11$
3) $80 = \frac{w}{9}$	**4)** $135 = 5g$

For problems 5-7: write an equation, solve, and then check using substitution

5) Carmen participated in a read-a-thon. Mr. Cole pledged $4 per book and gave carmen $44. How many books did Carmen read?
6) Robert is dividing his baseball cards equally among himself, his brother, and three other friends. Robert was left with 9 cards. How many cards did Robert give away?
7) Lee drove 420 miles and used 15 gallons of gas. How many miles did Lee's car travel per gallon of gas?

Name:_____ Date:_____ Class:_____

Homework 12-3

For Problems 1-4: solve, and then check using substitution.

1) $16e = 32$	**2)** $\frac{p}{8} = 20$
3) $100 = 25x$	**4)** $\frac{3}{4} = \frac{3}{5}x$

For problems 5-7: write an equation, solve, and then check using substitution.

5) Mel drives 3.5 hours per day to town for business meetings. Last week she drove for a total of 14 hours. How many days did she drive to the city?

6) Jorge baked cookies for his math class. There are 28 people in his math class including himself and the teacher. He baked enough cookies for everyone to get 3 cookies each. How many cookies did Jorge bake?

7) Twice a number equals 230. What is the number? (Write an equation, solve, then check.)

Spiral Review

1) Janice paid $15 for 4 gallons of gas. How much will 10 gallons of gas cost?	2) Coraline made $52.50 after selling 21 muffins. What was the unit rate for cost of muffins? (unit rate means "rate per <u>one</u>")
3) 2 is 40% of what number?	4) Solve. $9 \div \frac{3}{8} =$
5) 677 feet below sea level. Write as an integer.	6) Write the expression as a phrase $12 - xy$ _____

Name _____

6.EE.5, 6.EE.8 Lesson 12-4

Using Inequalities to Describe Quantities

Learning Target: I can use inequalities to represent real-world constraints or conditions

Do Now

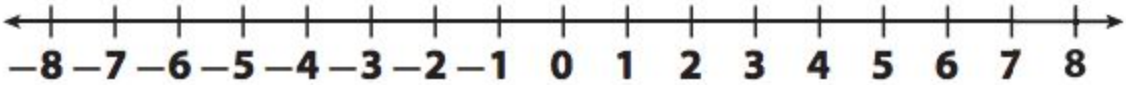
Rick and Levi together have 86 cards. Enrique has 21 cards. Write and solve an equation to determine the number of c cards Levi has.

Opening- Using Inequalities to Describe Quantities

You can use inequality symbols with variables to describe quantities that can have many values.

Symbol	Meaning	Word Phrases
$<$	Is less than	Fewer than, below
$>$	Is greater than	More than, above
$\leq$	Is less than or equal to	At most, no more than
$\geq$	Is greater than or equal to	At least, no less than

A) The lowest temperature ever recorded in Florida was -2 ◦F. Graph this temperature on the number line below.



B) The temperatures 0℉ ,3℉, 6℉, 5℉, and -1℉ have also been recorded in Florida. Graph these temperatures on the number line above.

C) How do the temperatures in Part B compare to -2? How can you see this relationship on the number line?

_____

_____

D) How many other numbers have the same relationship to -2 as the temperature in B? Give some examples.

_____

_____

E) Suppose you could graph all the possible answers to Part D on a number line. What would the graph look like?

_____

_____

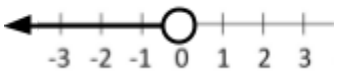
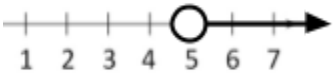
F) Let x represent all the possible answers to Part D.

Complete this inequality: x ___ -2

Example 1- Graphing the Solutions of an Inequality

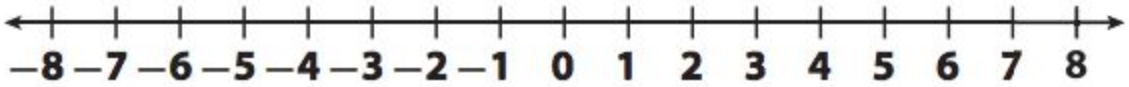
★ **<u>INEQUALITY:</u> A mathematical sentence that shows the relationship between quantities that are _____ _____.**

★ **An inequality uses >, <, ≥, or ≤ instead of = .**

$x < 0$	$x \leq 0$	$x > 5$	$x \geq 5$
			
LESS THAN	**LESS THAN OR EQUAL TO; AT MOST**	**GREATER THAN**	**GREATER THAN OR EQUAL TO; AT LEAST**

Inequality	Open or Closed Circle?	Shaded Right or Left?
$x < -0.45$		
$x \geq 18$		
$x > \frac{2}{5}$		
$x \leq 4$		

Graph the inequality: $x \leq -2$



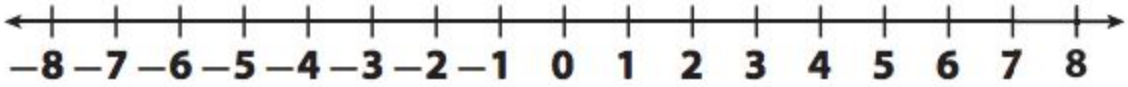
★ **A _____ of an inequality that contains a variable is any value of the variable that makes the inequality _____.**

Step 1: Substitute -3 for y

$y \leq -3$ ⇨ _____ ≤ -3

Is -3 a solution to the inequality? (Does substituting -3 make this inequality true?)

Step 2: Graph the inequality $y \leq -3$



So when graphing $y \leq -3$ we use a _____ circle to show that the

_____

Step 3: What are three other possible solutions to $y \leq -3$?

Solution: _____	**Solution:** _____	**Solution:** _____
_____ ◯ _____	_____ ◯ _____	_____ ◯ _____

Reflect:

1) Inez says you can write $m \geq 1$ as $1 \leq m$. Do you agree? Explain.

When $m = 4$ is $m \geq 1$ true?	When $m = 4$ is $1 \leq m$ true?

_____

_____

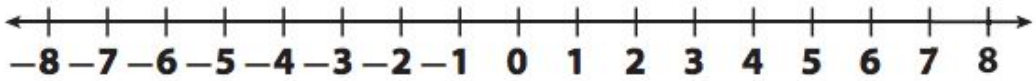
Example 2

Step 1: Substitute 1 for x in the inequality $x < 1$

$x < 1$ ⇨ _____ < 1

Is 1 a solution to the inequality? (Does substituting 1 make this inequality true?)

Step 2: Graph the inequality $x < 1$



So when graphing $x < 1$ **we use an _____ circle to show that the**

_____

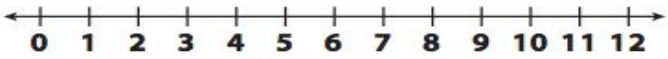
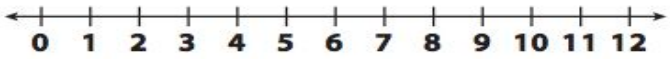
Step 3: What are three other possible solutions to $x < 1$ **?**

Solution: _____	**Solution:** _____	**Solution:** _____
_____ ○ _____	_____ ○ _____	_____ ○ _____

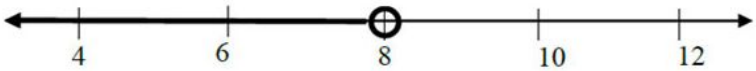
How is $x < 5$ **different from** $x \leq 5$**? Explain.**

_____

_____

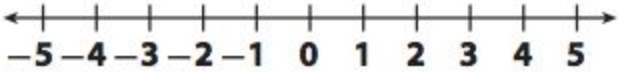
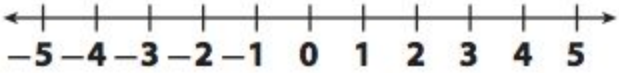
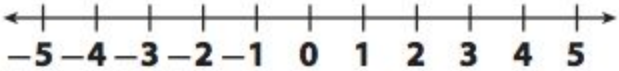
Graph $x < 5$	Graph $x \leq 5$
	

Write an inequality that matches the graph below:



_____ ○ _____

Exercise 1

Inequality	Graph	3 Other Possible Solutions
1) $b \geq -2$		
2) $-3 > s$		
3) $x \leq 1.5$		

Example 3 - Writing and Graphing Inequalities from Real-World Scenarios

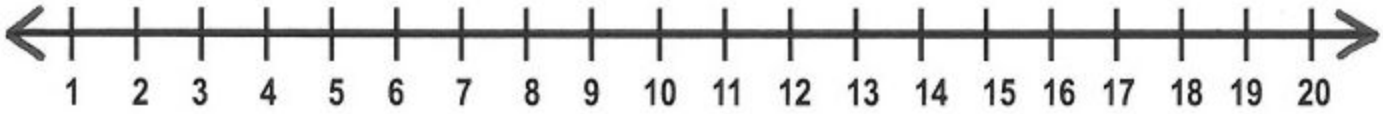
You can write an inequality to model the relationship between an algebraic expression and a number. You can also write inequalities to represent certain real-world situations.

A) Write an inequality that represents the following scenario:

Joe is a bodybuilder. In order to keep up his strength and weight to perform in competitions, he needs to eat at least 9 eggs a day.

Step 1: Write the inequality to represent the scenario.

Step 2: Graph the inequality and its solutions.



Reflect: Why do you shade in the circle versus leaving it unshaded?

_____

_____

Reflect: Why do you shade the arrow on the number line?

_____

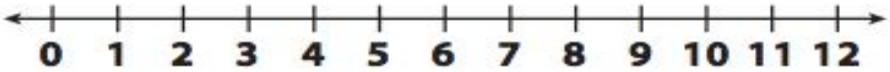
_____

B) Write and graph an inequality to represent this situation:

To test the temperature rating of a coat, a scientist keeps the temperature below 5℃.

Step 1: Write the inequality. Let t represent the temperature in the lab.

Step 2: Graph the inequality and its solutions.



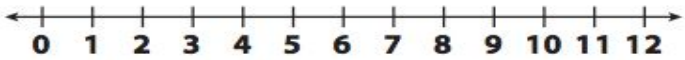
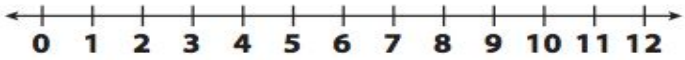
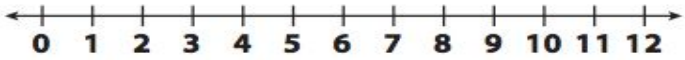
Step 3: What are three other possible solutions to $x < 1$?

Solution: _____	**Solution:** _____	**Solution:** _____
_____ ○ _____	_____ ○ _____	_____ ○ _____

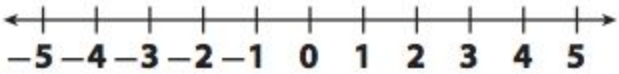
Key Words to Describe Inequalities

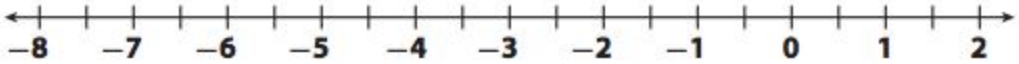
GREATER THAN OR EQUAL TO **> or ≥**	LESS THAN OR EQUAL TO **< or ≤**

Exercise 2 - Writing Inequalities From Real-World Scenarios

1) Andrew will choose less than 3 pieces of candy. Inequality: _____ ◯ _____ Graph:  **3 Other Possible Solutions:**	2) The temperature in Chicago, Illinois was at most 6∘F. Inequality: _____ ◯ _____ Graph: **3 Possible Solutions:**
3) Each package must weigh more than 4.5 pounds. Inequality: _____ ◯ _____ Graph:  **3 Possible Solutions:** _____	4) Ben is volunteering at minimum 5 hours a week. Inequality: _____ ◯ _____ Graph:  **3 Possible Solutions:** _____

Problem Set

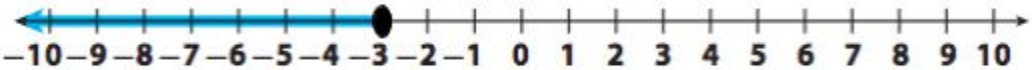
1) Circle the following numbers that are solutions to $x \geq 0$ - 5 0.03 -1 0 1.5 -6 $\frac{1}{2}$
2) Graph the inequality $1 \leq x$.      **Check your solution:**
3) Graph the inequality $-4\frac{1}{2} > x$.



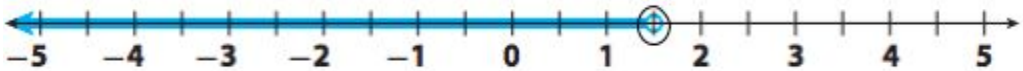
Check your solution:

For problems 4-5, write an inequality that matches the number line model.

4) _____ ◯ _____



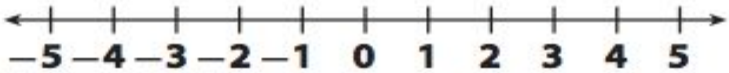
5) _____ ◯ _____



For problems 6-7, write and graph an inequality to represent each situation.

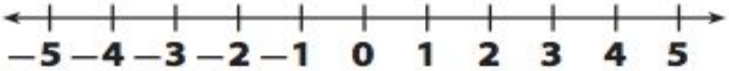
6) During hibernation, a garter snake's body temperature never goes below 3◦C.

_____ ◯ _____



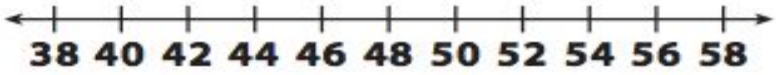
7) The temperature is less than 3.5◦F.

_____ ◯ _____



8) A child must be at least 48 inches tall to ride a roller coaster.

a. Write and graph an inequality to represent this situation. _____ ◯ _____



b. Can a child who is 46 inches tall ride the roller coaster? Explain.

_____

_____

9) Explain how to graph the inequality $8 \geq y$.

_____

_____

10) The number line shows an inequality. Describe a real-world situation that the inequality could represent.

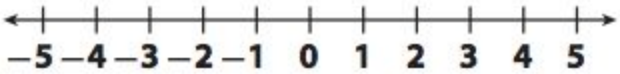
_____

_____

Name: _____ Date: _____ Period: _____

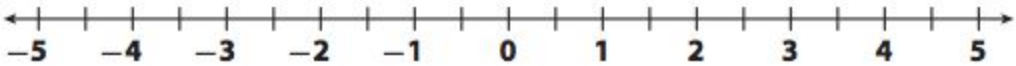
Homework for Lesson 12-4

1) Graph the inequality $-3 > z$.



Check your solution:

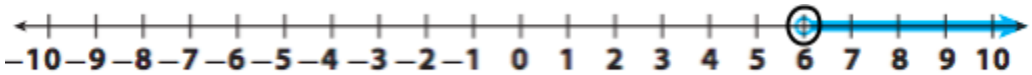
2) Graph the inequality $n > 2.5$.



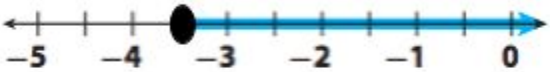
Check your solution:

For problems 3-4, write an inequality that matches the number line model.

3) _____



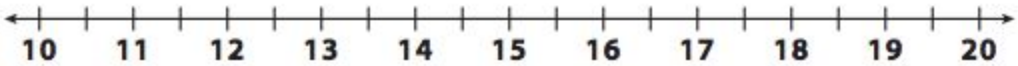
4) _____



For problems 5-6, write and graph an inequality to represent each situation.

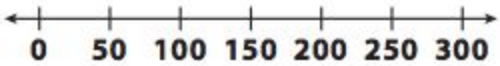
5) Nina wants to take at least $15 to the movies.

_____

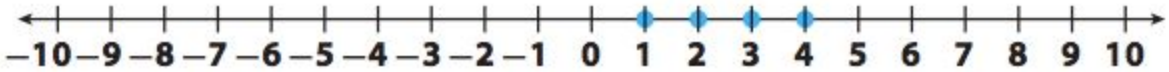


6) The goal of the fundraiser is to make more than 150.

_____



7) Natasha is trying to represent the following situation with a number line model. There are fewer than 5 students in the cafeteria. She has to come up with two possible representations, shown below. Which is the better representation, and why?



_____

_____

_____

Spiral Review

1) Jane bought five 3-pound bags of apples to make apple pies. How many ounces of apples did Jane buy? (1 pound = 16 ounces)	2) Kara bought a 5-pack of iTunes gift cards for $75.00. Leah bought an 8-pack of iTunes gift cards for $104. What is the price per iTunes gift card for each of them? Who got the better deal?
3) David's team scored 60 points at the basketball game. David scored 15% of the team's points. How many points did David score?	4) After Kelly paid $26.50 for books, $3.55 for paper, and $4.36 for pens, she had $5.98 left. How much money did Kelly have to start with?

Name _____

Module 12 Study Guide Review

Lesson		
12-1 Writing equations	1. $4x = 25$; $x = 5$ Solve to check:	2. Sophia is 3 years younger than Craig. Sophia is 12 years old. Equation_____
	3. Kelly has read 87 pages of a book today. The book has a total of 210 pages. Write an equation to express the pages p Kelly has left to read & solve. Equation: _____ Solve:	
12 -2 part A	4. Solve and check using substitution: $b + 33.05 = 55$	5. Write, solve and check using substitution: Anna made 14 cookies. She is left with 3, how many did she give away?
	6. Write a real-world problem for the equation $8x = 72$. Then solve and check the problem.	

12-4 Using inequalities to describe quantities	**7. Kelly has read 87 pages of a book today. The book has a total of 210 pages. Write an equation to express the pages p Kelly has left to read & solve.** **Equation:** **_____** **Solve:**	**8.** **3x - 5 < 10** **Graph:**
Writing & Solving Real-World Inequalities	$2 \leq -15 + x$ **9. Solve:** **Graph:** 	**10. Laverne is making bags of party favors for each of the 6 friends attending her party. She does not want to spend more than $42. If p represents the cost of a party favor, write, solve, and graph an inequality to represent the possible cost of each party favor.** **Inequality:** **_____** **Graph:**
	11. Matt wants to make sure everyone gets enough animal crackers. There are 5 people all together and he wants to make sure everyone gets at least 8 crackers. Write an inequality to show how many crackers C Matt would need. **Inequality:_____**	