

6th Grade CCA Unit #4: Inequalities

Resources: Big Ideas: Chapter 3

Common Core Standards: 7.EE.4b

Main Focus: Solving Inequalities

Number	Learning Targets	Big Ideas Section
1	I can write and graph inequalities and check whether numbers are solutions to inequalities.	4.1
2	I can solve inequalities by adding and subtracting.	4.2
3	I can solve inequalities by multiplying and dividing.	4.3
4	I can solve two-step inequalities.	4.4
5	I can solve two-step inequality word problems	Extra

My Practice:

Number	Pre-test:	Exit slip scores	Day #2 Homework	Extra Targeted Practice	Post-test:
1	_____/6				_____/10
2	_____/6				_____/8
3	_____/6				_____/9
4	_____/3				_____/9
5	_____/4				_____/7

My Final Pretest Score: _____ /25

My Final Pretest Percent _____ %

My Final Posttest Score: _____ /44

My Final Posttest Percent: _____ %

My percent of increase between the Pre and Post test scores = _____ !!

①

Section 4.1: Graphing and Writing Inequalities Notes

POD: Solve each equation.

1.) $-4 - 2m = 12$

2.) $3 - \frac{x}{5} = 7$





Objective: To graph and write inequalities.

Vocabulary:

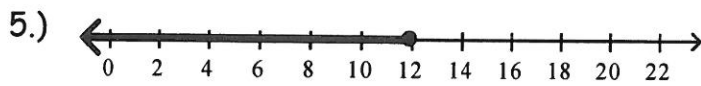
1. inequality - a mathematical sentence that contains $>$, $<$, \geq , \leq , \neq
2. solution of an inequality - any value that make the inequality true

Symbol	How to Read It	Circle's Appearance
$>$	greater than	open (not a solution)
$<$	less than	open (not a solution)
\geq	greater than or equal to	closed (is a solution)
\leq	less than or equal to	closed (is a solution)

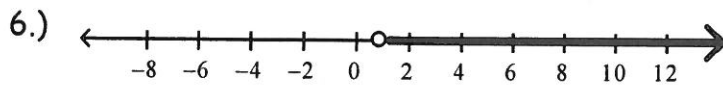
Graph the solutions of each inequality.

1.) 	2.) 
3.) 	4.) 

Write an inequality for each graph.



Answer:



Answer:

Write an inequality for each statement.

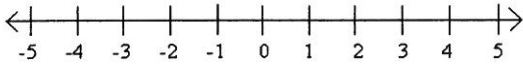
7.) To qualify for the race, your time cannot be over _____ seconds.

8.) The car ride to the park will take at least _____ minutes.

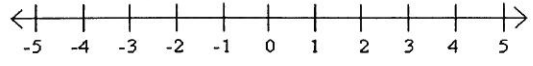
Section 4.1: Writing & Graphing Inequalities Homework Day 1

Graph the Solution.

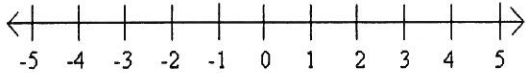
1.) $x > -4$



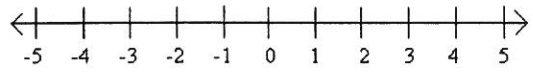
2.) $m \geq 2$



3.) $n \leq 5$



4.) $x < -1$



Write an inequality.

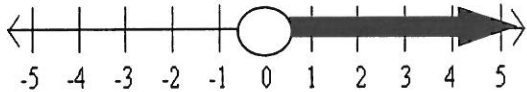
5.)



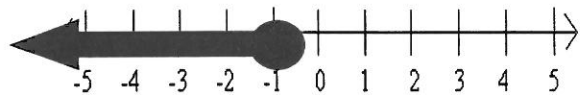
6.)



7.)



8.)



Write an inequality.

9.) the Bears' ticket is at least \$250

10.) the mall is less than 10 miles away from school

11.) the cost, c , for the field trip is at most \$7

12.) To see a movie, you must be at least 17 years old

13.) Circle which numbers are solutions of the inequality.

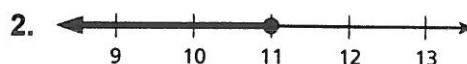
13a.) $x \leq -2$: -3, -2, -1, 0

13b.) $x > 3$: -3, 3, 4, 5

14.) When graphing an inequality, how do you know when to use a closed circle or open circle?

4.1 Writing and Graphing Inequalities HW Day 2

Write an inequality for the graph. Then, in words, describe all the values of x that make the inequality true.



Write the word sentence as an inequality.

3. A number x is at least 15.
4. A number r added to 3.7 is less than 1.2.
5. A number h divided by 2 is more than -5 .
6. A number a minus 8.2 is no greater than 12.

Tell whether the given value is a solution of the inequality.

7. $p + 1.7 \geq -4$; $p = -9$
8. $-3y < -5$; $y = 1$
9. $1.5g \leq 6$; $g = 0$
10. $\frac{3}{4} - d > \frac{1}{3}$; $d = \frac{1}{2}$

Graph the inequality on a number line.

11. $\ell \leq 3.5$

12. $m > -15$



13. To get a job at the local restaurant, you must be at least 16 years old. Write an inequality that represents this situation.

Tell whether the given value is a solution of the inequality.

14. $5t < 4 - t; t = -3$

15. $\frac{q}{5} < q - 20; q = 15$

16. In order to qualify for a college scholarship, you must have acceptable scores in either the SAT or the ACT along with the following requirements: a minimum GPA of 3.5; at least 12 credits of college preparatory academic courses; and at least 75 hours of community service.

a. Write and graph three inequalities that represent the requirements.



b. Your cousin has a GPA of 3.6, 15 credits of college preparatory class, and 65 hours of community service. Does your cousin satisfy the requirements? Explain.

Section 4.2: Solving Inequalities by Adding or Subtracting Notes

POD: Solve the equations.

1.) $-7 + x = 15$

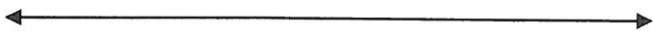




2.) $x + 5 = 11$

Objective: To solve inequalities by adding or subtracting.

Steps for Solving One-Step Inequalities Involving Addition or Subtraction:

1. Solve for the variable the same way you solve when it's an equation (you want to get the variable alone on one side of the inequality).
2. Graph your solution.

Examples: Solve each inequality. Graph your solution.

1.) Equation:	1.) Graph: 
2.) Equation:	2.) Graph: 
3.) Equation:	3.) Graph: 
4.) Equation:	4.) Graph: 
5.) Equation:	5.) Graph: 

7.) The drama club can spend no more than \$120 for costumes. They spent \$79, how much more can they spend?

4.2

Solving Inequalities Adding and Subtracting HW Day 1

Solve the inequality. Graph the solution.

1. $p - 4 < 2$

2. $s + 1 \geq -5$



3. $k - 14 \leq -10$

4. $2 < n + \frac{3}{2}$



5. $z - \frac{2}{3} \geq \frac{1}{3}$

6. $-\frac{1}{2} > -\frac{1}{6} + t$



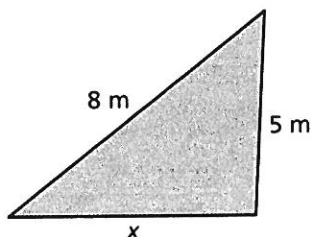
7. $d - 2.4 \leq -5.1$

8. $-4.5 + q > 2.5$

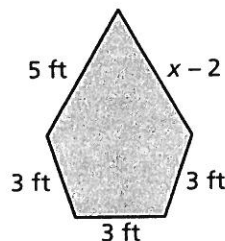


Write and solve an inequality that represents x .

9. The perimeter is less than 20 meters.



10. The perimeter is at least 18 feet.



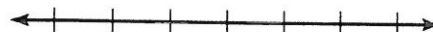
4.2

Solving Inequalities By Adding and Subtracting Homework Day 2

Solve the inequality. Graph the solution.

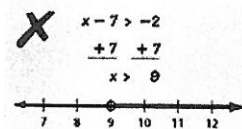
1. $y - 3 \geq -12$

2. $-14 \leq 8 + x$



3. $-3.4 > c - 1.2$

4. Describe and correct the error.



5. A bounce house can hold 15 children. Seven children go in the bounce house. Write and solve an inequality that represents the additional number of children that can go in the bounce house.

6. Is the inequality $c + 3 > 5$ the same as $c > 5 - 3$? Explain your reasoning.

7. The solution of $d + s > -3$ is $d > -7$. What is the value of s ?

8. The hole for a birdfeeder is 3 feet deep. The top of the post needs to be at least 5 feet above the ground. Write and solve an inequality that represents the required length of the post.

9. The possible values of x are given by $x + 8 \leq 6$. What is the greatest possible value of $7x$?

Section 4.3: Solving Inequalities by Multiplying or Dividing Notes

POD:

1.) $-5 + x < 10$

2.) $-12 \leq 4 + x$

Objective: Students will be able to solve inequalities by multiplying or dividing. Students will write down the steps to solving a one-step inequality on a white board.

Steps for Solving One-Step Inequalities Involving Multiplication or Division:

1. Solve for the variable the same way you solve when it's an equation (you want to get the variable alone on one side of the inequality).
2. Graph your solution if required.

*******SPECIAL RULE:** If you multiply or divide each side of an inequality by a **NEGATIVE** number, you **FLIP** the inequality symbol.*****

1.)	2.)
3.)	4.)
5.)	6.)

7.) A recipe for an apple pie calls for 6 apples per pie. You have 27 apples. At most how many apple pies can you make?

4.3

Solving Inequalities by Multiplying and Dividing Homework Day 1

Solve the inequality. Graph the solution.

1. $6n < 90$

2. $\frac{x}{4} \leq -18$

3. $-20t > -80$



4. $-3q \geq 91.5$

5. $-4p < \frac{2}{3}$

6. $-8 \geq 1.6m$



7. $-\frac{r}{4} \leq -10$

8. $-\frac{t}{5} > 2.5$

9. $-2 \geq \frac{q}{-0.3}$



10. To win a game, you need at least 45 points. Each question is worth 3 points. Write and solve an inequality that represents the number of questions you need to answer correctly to win the game.

4.3**Solving Inequalities by Multiplying and Dividing Homework Day 2**

Write the word sentence as an inequality. Then solve the inequality.

1. Five times a number is at least 15.
2. The quotient of a number and 4 is less than -1 .

Solve the inequality.

3. $\frac{g}{-3.2} > 4$

4. $-12 > -9h$

5. You are creating a decorative rope that is at least 30 feet long.
 - a. To create the rope you are using beads that are 6 inches long. Write and solve an inequality that represents the number of beads that you can use.
 - b. You do not have enough 6-inch beads to make the rope, so you will use 10-inch beads instead. Write and solve an inequality that represents the number of 10-inch beads that you can use.
6. Explain how solving $4x < -16$ is different from solving $-4x < 16$.
7. Write an inequality that when it is solved, the direction of the inequality symbol will be reversed.
8. You have \$9.60 to buy avocados for a guacamole recipe. Avocados cost \$2.40 each. Write and solve an inequality that represents the number of avocados you can buy.
9. It is currently 0°C outside. The temperature is dropping 2.5°C every hour. Write and solve an inequality that represents the number of hours that must pass for the temperature to drop below -20°C .

Section 4.4: Solving Two-Step Inequalities Notes

POD: Solve.

1.) $3 - \frac{x}{2} = -6$

2.) $3 - 4x = -9$

Objective: To solve and graph two-step inequalities.

Steps for Solving Two-Step Inequalities:

- 1.) Use the same steps for solving two-step equations.
- 2.) Flip the inequality symbol when you multiply or divide by a negative number.

Symbol	How to Read It	Circle's Appearance
$>$	greater than	open (not a solution)
$<$	less than	open (not a solution)
\geq	greater than or equal to	closed (is a solution)
\leq	less than or equal to	closed (is a solution)

Examples: Solve each inequality.

1.)	2.)
3.)	4.)

5.)

6.)

7.) Yellow Cab taxi charges a \$1.75 flat rate in addition to \$0.65 per mile. Katie only has \$10 for her ride. How many miles can Katie travel without exceeding her limit?

Section 4.4: Solving Two-Step Inequalities Homework Day 1

Directions: Solve each two-step inequality.

1.) $5a + 2 \leq 17$

2.) $7b + 2 \geq 23$

3.) $9 - c > 10$

4.) $27 \leq 6 + \frac{n}{3}$

5.) $12 > -6e + 6$

6.) $9 - \frac{n}{4} \leq -8$

7.) $3 < 1 + \frac{n}{2}$

8.) $-8f + 18 > -22$

9.) $-20k + 20 < 100$

10.) $50 < 8 - 6h$

11.) $38 \geq 9j - 7$

12.) $30 \geq -6(5 - g)$

13.) How do you check that an inequality is correct?

4.4**Solving Two Step Inequalities Homework Day 2****Solve the inequality.**

1. $3m - 7 < 2$

2. $-13 \leq -5r + 2$

3. $2k + \frac{1}{3} > 1$

4. $4.3 - 1.5c \leq 10$

Solve the inequality. Graph the solution.

5. $\frac{x}{2} + 5 > 8$

6. $3 - \frac{x}{4} < -2$

7. $5 - \frac{x}{9} > 10$

8. $-1 \leq 5 + \frac{x}{7}$

9. Your weekly base salary is \$150. You earn \$20 for each cell phone that you sell.

a. What is the minimum amount you can earn in a week?

b. Write and solve an inequality that represents the number of cell phones you must sell to make at least \$630 a week.

c. The company policy is that as a part-time employee, the maximum you can earn each week is \$950. Write and solve an inequality that represents the number of cell phones you can sell each week.

10. Compare and contrast solving two step equations to solving two step inequalities.

Section 4.4E: Inequality Word Problems Notes

POD: Solve.

1.) $-8 < 2x - 4$

2.) $3 - \frac{x}{5} \geq 9$

Objective: To solve inequality word problems.

Examples: Decide whether the question is an inequality or equation. Set up an initial problem and then solve.

1.) It costs \$2.50 to rent bowling shoes. Each game costs \$2.25. You have \$10.00. At least how many games did you bowl if you had \$10.00?

Inequality:

Answer:

2.) A theater charges \$9.50 per ticket. The theater has already sold 70 tickets. How many more tickets does the theater need to sell to earn at least \$1000?

Inequality:

Answer:

3.) Kent has \$500 in his savings account at the beginning of the summer. He wants to have at least \$200 by the end of the summer. He takes out \$25 every week. At most, how many weeks can Kent withdraw money from his account?

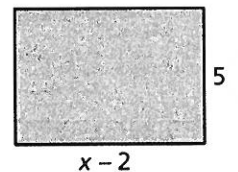
Inequality:

Answer:

4.) Write and solve an inequality that represents the values of x for which the area of the rectangle will be at least 50 square feet.

Inequality:

Answer:



Name: _____

Inequality Word Problems Homework Day 1

1.) Dale has \$25 to spend at a carnival. If the admission to a carnival is \$4 and the rides cost \$1.50 each, what is the greatest number of carnival rides Dale can go on? Write an inequality and solve.

2.) Kelly bought an ice cream sundae for \$2.50 plus \$0.35 per topping. Altogether, Kelly has \$3.55. At most, how many toppings can Kelly have on her sundae? Write an inequality and solve.

3.) The sixth grade class is putting on a variety show to raise money. It costs \$700 to rent the banquet hall they are going to use. If they charge \$15 for each ticket, what is the minimum amount of tickets they need to sell in order to raise at least \$1000? Write an inequality and solve.

4.) Your school's soccer team is trying to break the school record. The record is 138 goals and the team already has 88 goals this season. With 10 games remaining in the season, at least how many goals do they need per game in order to break the record?

5.) A going out of business sale is selling video games online for \$14.50 each. There is a flat-rate shipping charge of \$6. You have at most \$50 you can spend. At most, how many games can you buy?

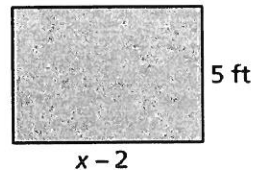
6.) An RV park receives \$300 per month from each residential site that is occupied as well as \$2000 per month from their overnight sites. Write and solve an inequality to find the number of residential sites that must be occupied to make at least \$14,000 in revenue each month.

Name: _____

Inequality Word Problems Homework Day 2

- 1.) An animal shelter has fixed weekly expenses of \$750. Each animal in the shelter costs an additional \$6 a week.
 - a. During the summer months, the weekly expenses are at least \$1170. Write and solve an inequality that represents the number of animals at the shelter for expenses to be at least \$1170 a week.
 - b. During the winter months, the weekly expenses are at most \$900. Write and solve an inequality that represents the number of animals at the shelter for expenses to be at most \$900 a week.
 - c. The cost for each animal has increased by \$2. What will be the maximum weekly expenses during the winter months?
- 2.) You have \$30 to buy baseball cards. Each pack of cards costs \$5. Write and solve an inequality that represents the number of packs of baseball cards you can buy and still have at least \$10 left.
- 3.) The first jump in a unicycle high-jump contest is 10 cm. The bar is raised 2 centimeters after each jump. Write and solve an inequality to find the number of additional jumps needed to meet or exceed the goal of clearing a height of 26 centimeters.
- 4.) You are renting a moving truck for a day. There is a daily fee of \$20 and a charge of \$0.75 per mile. Your budget allows a maximum total cost of \$65. Write and solve an inequality that represents the number of miles you can drive the truck.


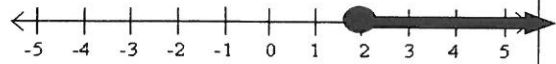

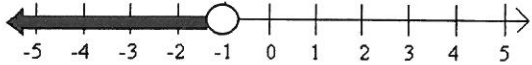
- 5.) Write and solve an inequality that represents the values of x for which the area of the rectangle will be at least 35 square feet.





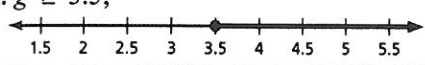
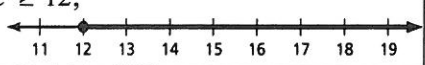

- 6.) You borrow \$200 from a friend to help pay for a new laptop computer. You pay your friend back \$12 per week. Write and solve an inequality to find when you will owe your friend less than \$80.

CCA Homework Answer Key for Unit 4: Inequalities

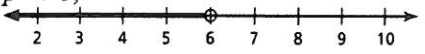
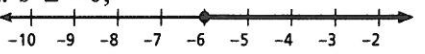

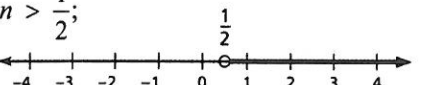
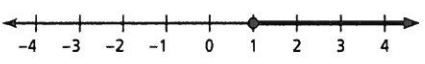
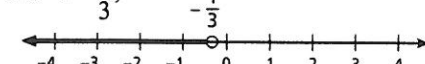
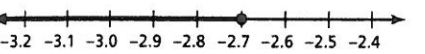
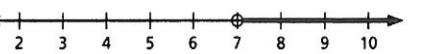
4.1 Homework Day 1:

1.) $x > -4$ 	2.) $m \geq 2$ 					
3.) $n \leq 5$ 	4.) $x < -1$ 					
5.) $x \geq -3$	6.) $x < 2$	7.) $x > 0$	8.) $x \leq -1$	9.) $t \geq 250$	10.) $m < 10$	11.) $c \leq 7$
12.) $y \geq 17$	13a.) -3 & -2	13b.) 4 & 5	14.) open $<$ or $>$ closed \leq or \geq			

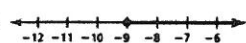
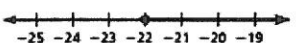
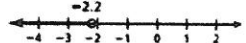
4.1 Homework Day 2:

1. $x > -4$; all values of x greater than -4	2. $x \leq 11$; all values of x less than or equal to 11	3. $x \geq 15$	4. $r + 3.7 < 1.2$			
5. $\frac{h}{2} > -5$	6. $a - 8.2 \leq 12$	7.no	8.no	9.yes	10. no	11. 
12. 	13. $a \geq 16$	14. yes		15. no		
16. a. $g \geq 3.5$; 	$c \geq 12$; 		$h \geq 75$; 			
b.no; Your cousin only has 65 hours of community service and needs at least 10 more hours to meet that requirement.						


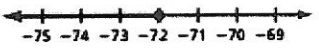

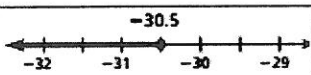
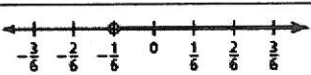
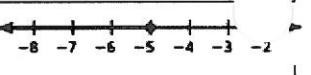

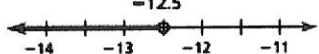
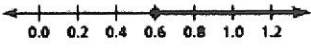
4.2 Homework Day 1:

1. $p < 6$; 	2. $s \geq -6$; 	3. $k \leq 4$; 
4. $n > \frac{1}{2}$; 	5. $z \geq 1$; 	6. $t < -\frac{1}{3}$; 
7. $d \leq -2.7$; 	8. $q > 7$; 	9. $x + 13 < 20$; $x < 7$ meters
10. $x + 12 \geq 18$; $x \geq 6$ feet		

4.2 Homework Day 2:

1. $y \geq -9$; 	2. $x \geq -22$; 	3. $c < -2.2$; 
4.) $-2 + 7 = 5$; $x > 5$	5.) $x + 7 \leq 15$; $x \leq 8$ children	6.) yes, when you solve the inequalities you get $c > 2$
7.) $s = 4$	8.) $x - 3 \geq 5$; $x \geq 8$ ft	9.) $x \leq -2$; -14

4.3 Homework Day 1:

1. $n < 15$; 	2. $x \leq -72$; 	3. $t < 4$; 
4. $q \leq -30.5$; 	5. $p > -\frac{1}{6}$; 	6. $m \leq -5$; 
7. $r \geq 40$; 	8. $t < -12.5$; 	9. $q \geq 0.6$; 

10. $3x \geq 45$; $x \geq 15$; You must answer at least 15 questions correctly to win the game.

4.3 Homework Day 2:

1.) $5x \geq 15$; $x \geq 3$	2.) $\frac{x}{4} < -1$; $x < -4$	3.) $g < -12.8$	4.) $h > 1\frac{1}{3}$	5a.) $6x \geq 30$; $x \geq 5$ beads
5b.) $10x \geq 30$; $x \geq 3$ beads		6.) The first one is dividing both sides by 4 versus dividing by -4.		
7.) $-2x \leq 10$	8.) $2.40x \leq 9.60$; $x \leq 4$ avocados	9.) $-2.5x \leq -20$; $x \geq 8$ hours		

4.4 Homework Day 1:

1.) $a \leq 3$	2.) $b \geq 3$	3.) $c < -1$	4.) $n \geq 63$	5.) $e > -1$
6.) $n \geq 68$	7.) $n > 4$	8.) $f < 5$	9.) $k > -4$	10.) $h < -7$
11.) $j \leq 5$	12.) $g \leq 10$	13.) First you need to mathematically check to see if it works. So plug in the exact number and see if it works. Then to see if the inequality is right, pick a number that fits in the inequality, and see if it works with the original problem.		

4.4 Homework Day 2:

1.) $m < 3$	2.) $r \leq 3$	3.) $k > \frac{1}{3}$	4.) $c \geq -3.8$	5.) $x > 6$	6.) $x > 20$	7.) $x < -45$	8.) $x \geq -42$
9a.) \$150	9b.) $150 + 20c \geq 630$; $c \geq 24$, at least 24			9c.) $150 + 20c \leq 950$; $c \leq 40$, at most 40			
10.) Equal sign vs. Inequality sign. You have to flip the inequality sign when you multiply or divide by a negative. The equation problem tells you an exact answer and the inequality problem tells you the range of answers.							

Inequality Word Problems Homework Day 1:

1.) $4 + 1.50x \leq 25$; $x \leq 14$ rides	2.) $2.5 + 0.35x \leq 3.55$; $x \leq 3$ toppings
3.) $15x - 700 \geq 1000$; $x \geq 114$ tickets	4.) $10x + 88 > 138$; $x > 5$ games
5.) $14.50x + 6 \leq 50$; $x \leq 3$ games	6.) $300x + 2000 \geq 14,000$; $x \geq 40$ sites

Inequality Word Problems Homework Day 2:

1a.) $750 + 6x \geq 1170$; $x \geq 70$ animals	1b.) $750 + 6x \leq 900$; $x \leq 25$ animals	1c.) \$950	2.) $30 - 5c \geq 10$; $c \leq 4$ packs
3.) $2n + 10 \geq 26$; $n \geq 8$ jumps	4.) $20 + 0.75x \leq 65$; $x \leq 60$ miles	5.) $5(x - 2) \geq 35$; $x \geq 9$	6.) $200 - 12x < 80$; $x > 10$ weeks