

Solving Linear Inequalities

Algebra 9 Unit 2 Lesson 9

DO NOW ~ Friday 11/22

Given the inequality $-2x \leq 22$, is a value of -9 for x a possible solution?

$$-2(-9) \leq 22$$

$$18 \leq 22$$

yes, it is.



Classwork

a) Solve the following inequality.

$$\frac{1}{2}x \geq -16$$

$$x \geq -8$$

Solve the following inequality.

$$-3x > 9$$

$$x < -3$$

b) What are some possible solutions to the above inequality?

$$x \geq -8$$

-8, 9, 8, 10, 7

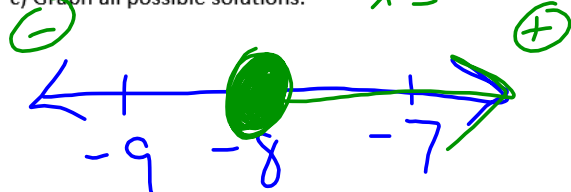
b) What are some possible solutions to the above inequality?

$$x < -3$$

-100, -4, -6

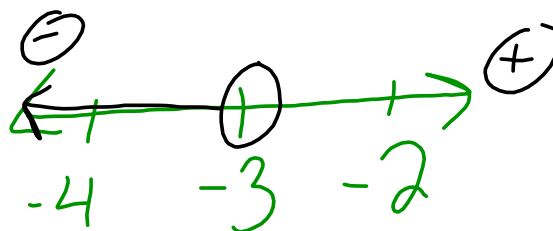
c) Graph all possible solutions.

$$x \geq -8$$

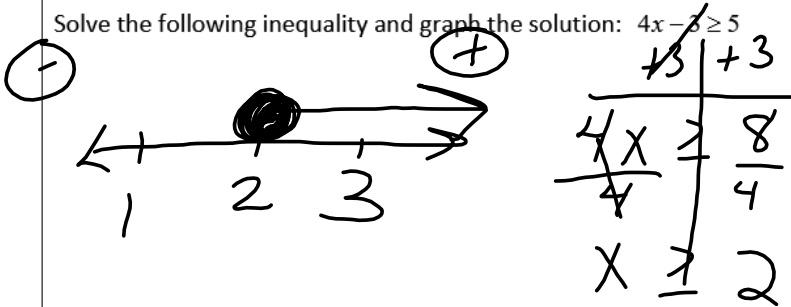


c) Graph all possible solutions.

$$x < -3$$



DO NOW ~ Monday 11/25

Solve the following inequality and graph the solution: $4x - 3 \geq 5$ 

Classwork

Given the linear inequality $8 - 2x > 16$ do the following:

a) Solve the inequality.

Handwritten solution for part (a):

$$\begin{array}{rcl}
 8 - 2x & > & 16 \\
 -8 & & -8 \\
 \hline
 -2x & > & 8 \\
 \frac{-2x}{-2} & > & \frac{8}{-2} \\
 x & < & -4
 \end{array}$$

The final solution $x < -4$ is circled in blue.

b) Pick a number that is true based on your solution to (a) and show that it makes the original inequality true.

Handwritten numbers: $-10, -5, -9$

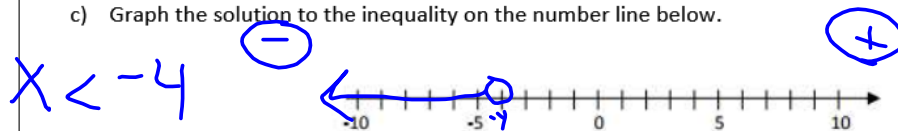
Handwritten word: True

Handwritten verification for $x = -9$:

$$\begin{array}{rcl}
 8 - 2x & > & 16 \\
 8 - 2(-9) & > & 16 \\
 26 & > & 16
 \end{array}$$

The final result $26 > 16$ is boxed in blue.

c) Graph the solution to the inequality on the number line below.

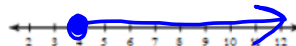


DO NOW ~ Tuesday 11/26

Solve and graph the following inequality:

$$6(7p + 7) \geq 210$$

$$\begin{array}{r} 42p + 42 \geq 210 \\ -42 \quad -42 \\ \hline 42p \geq 168 \\ \div 42 \quad \div 42 \\ \hline p \geq 4 \end{array}$$



$$p \geq 4$$



Classwork

a) Solve the following inequality.

$$8(6n - 4) - 5n \geq 312$$

$$\begin{array}{r} 48n - 32 - 5n \geq 312 \\ 43n - 32 \geq 312 \\ +32 \quad +32 \\ \hline 43n \geq 344 \\ \div 43 \quad \div 43 \\ \hline n \geq 8 \end{array}$$

a) Solve the following inequality.

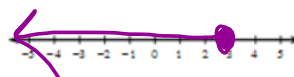
$$22 \geq 3x + 4 + 5x$$

$$\begin{array}{r} 22 \geq 6x + 4 \\ -4 \quad -4 \\ \hline 18 \geq 6x \\ \div 6 \quad \div 6 \\ \hline 3 \geq x \end{array}$$

b) Graph all possible solutions.



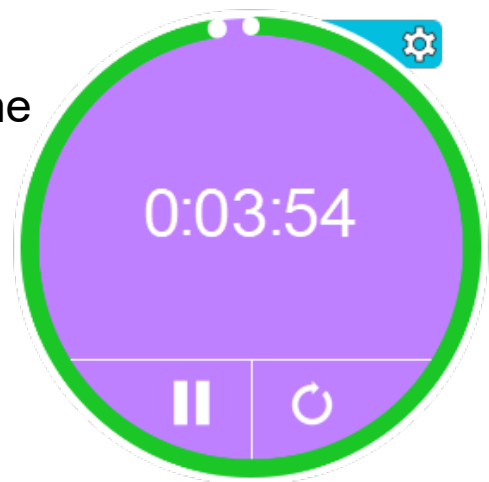
b) Graph all possible solutions.



$$x \leq 3$$

To earn your full participation point for the Do Now be sure to have completed all of the following by the time is up:

- 1) Be in your seat
- 2) Take out your calculator or grab one
- 3) Have last night's homework out
- 4) Complete the do now



DO NOW ~ Monday 12/2

Graph the following inequality: $x \leq -5$ 

Classwork

a) Solve the following inequality.

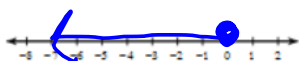
$$\begin{array}{rcl} \boxed{-7n-1} - \boxed{6n} & \geq & -1 \\ -13n - 1 & \geq & -1 \\ +1 & & +1 \\ \hline -13n & \geq & 0 \\ \frac{-13n}{-13} & \geq & \frac{0}{-13} \\ n & \leq & 0 \end{array}$$

Handwritten notes: To the right of the work, there are handwritten symbols: a circled 'D', a checkmark, and a '2'.

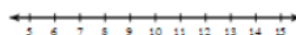
a) Solve the following inequality.

$$-7 \leq -4n + 3n$$

b) Graph all possible solutions.



b) Graph all possible solutions.

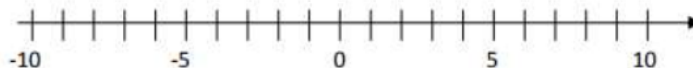


Mrs. Ferreri's Station ~ Solve and Graph Inequalities

ADD ONTO FOLDABLE FIRST

Solve. Show all of your work.

(a) $5x - 6 \leq 24$



(b) $2(5 - x) \leq 12$



(c) $6 - 4x > 18$



A Hamburger has 80 calories per ounce and the roll is 180 calories. French fries have approximately 15 calories each. If I want to have a 4 – oz. hamburger on a roll and some fries for lunch, how many fries can I eat if I want to keep my lunch under 900 calories?

Continue onto next page.

If I would like to have a 6-ounce hamburger, but no roll, and fries for lunch, how many fries can I eat if I want to keep my lunch under 1000 calories?

Two siblings Edwin and Rhea are both going skiing but choose different payment plans. Edwin's plan charges \$45 for rentals and \$5.25 per lift up the mountain. Rhea's plan was a bundle where her entire day cost \$108.

(a) Set up an inequality that models the number of trips, n , up the mountain for which Edwin will pay more than Rhea. Solve the inequality.

(b) What is the greatest amount of trips that Edwin can take up the mountain and still pay less than Rhea? Explain how you arrived at your answer.

Computer Station ~ Delta Math

Complete the "Solving Linear Inequalities" Assignment. Be sure to click the circle SEVERAL times to change it to an open circle if you need to.

Mrs. Kennedy's Station ~ Word Problems

Solve Algebraically.

Find three consecutive even integers such that the sum of the smallest integer and twice the second is 12 more than the third. [Only an algebraic solution will be accepted.]

If n is an odd integer, which equation can be used to find three consecutive odd integers whose sum is -3 ?

A. $n + (n + 1) + (n + 3) = -3$

B. $n + (n + 1) + (n + 2) = -3$

C. $n + (n + 2) + (n + 4) = -3$

D. $n + (n + 2) + (n + 3) = -3$

The statement "The sum of twice a number and 18 is greater than 25" can be expressed as

A. $2n + 18 = 25$

B. $2(n + 18) > 25$

C. $2(n + 18) > 50$

D. $2n + 18 > 25$

Mrs. Smith wrote "Eight less than three times a number is greater than fifteen" on the board. If x represents the number, which inequality is a correct translation of this statement?

A. $3x - 8 > 15$

B. $3x - 8 < 15$

C. $8 - 3x > 15$

D. $8 - 3x < 15$

Continue onto the next page.

Circle the correct answer.

1)



- a) $x \leq 14$ b) $x \geq 14$
c) $x < 14$ d) $x > 14$

2)



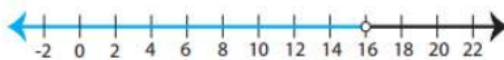
- a) $x < -1$ b) $x \leq -1$
c) $x \geq -1$ d) $x > -1$

3)



- a) $x \geq -10$ b) $x \leq -10$
c) $x > -10$ d) $x < -10$

4)



- a) $x > 16$ b) $x \geq 16$
c) $x \leq 16$ d) $x < 16$

5)



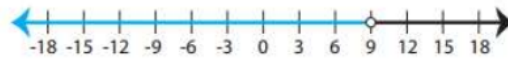
- a) $x > 8$ b) $x < 8$
c) $x \geq 8$ d) $x \leq 8$

6)



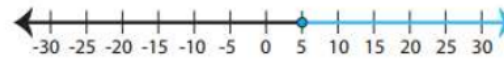
- a) $x < -4$ b) $x \leq -4$
c) $x \geq -4$ d) $x > -4$

7)



- a) $x < 9$ b) $x \geq 9$
c) $x \leq 9$ d) $x > 9$

8)



- a) $x < 5$ b) $x \leq 5$
c) $x \geq 5$ d) $x > 5$

Continue onto the next page.

1)



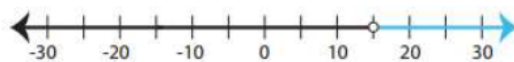
a) $x \leq -25$

b) $x < -25$

c) $x \geq -25$

d) $x > -25$

2)



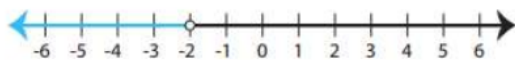
a) $x \geq 15$

b) $x > 15$

c) $x < 15$

d) $x \leq 15$

3)



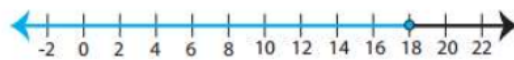
a) $x \geq -2$

b) $x \leq -2$

c) $x > -2$

d) $x < -2$

4)



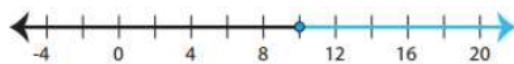
a) $x \leq 18$

b) $x > 18$

c) $x \geq 18$

d) $x < 18$

5)



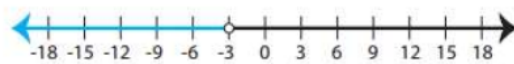
a) $x > 10$

b) $x < 10$

c) $x \geq 10$

d) $x \leq 10$

6)



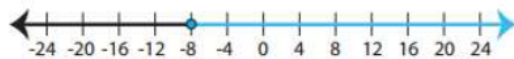
a) $x \leq -3$

b) $x < -3$

c) $x \geq -3$

d) $x > -3$

7)



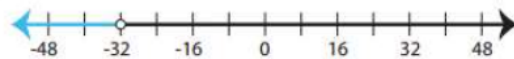
a) $x < -8$

b) $x \geq -8$

c) $x \leq -8$

d) $x > -8$

8)



a) $x < -32$

b) $x > -32$

c) $x \geq -32$

d) $x \leq -32$

Continue onto the next page.

Name at least 3 solutions for each inequality.

$$v < -2 \quad \underline{\hspace{2cm}}$$

$$x < -18 \quad \underline{\hspace{2cm}}$$

$$c > 4 \quad \underline{\hspace{2cm}}$$

$$b > -3 \quad \underline{\hspace{2cm}}$$

$$y \leq 0 \quad \underline{\hspace{2cm}}$$

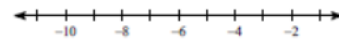
$$w \leq -4 \quad \underline{\hspace{2cm}}$$

$$a \geq -10 \quad \underline{\hspace{2cm}}$$

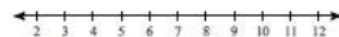
$$k \geq -20 \quad \underline{\hspace{2cm}}$$

Solve Algebraically.

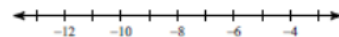
$$-140 < -4(-5x + 5)$$



$$159 < -1 + 4(8 + 4n)$$

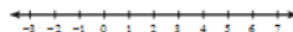


$$7(1 + 7p) - 5(-5 + 7p) \leq -80$$

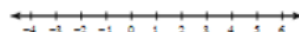


Homework ~ Monday 11/25

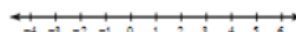
$$-4b + b \leq 3$$



$$6 < 1 + 3k + 2$$



$$-16 > 1 + 7p - 3$$



Homework ~ Monday 12/2

Which is the *smallest* integer that makes the inequality $2x + 3 > 5$ true?

A. 1

B. 2

C. 5

D. -4

Solve for x : $2x + 4 \leq 12$

Which inequality is equivalent to $2x + 6 > 2$?

A. $x > -2$

B. $x < -2$

C. $x > 2$

D. $x < 2$

Name: _____ Unit 2 Graded Classwork

Which equation can be used to solve the problem below?

If four times a number is increased by 15, the result is three less than six times the number. Find the number.

- A. $4(x + 15) = 6x - 3$ B. $4x + 15 = 6(x - 3)$ C. $4x + 15 = 6x - 3$ D. $4x + 15 = 3 - 6x$

Solve algebraically. Make sure you have a let statement and show all of your work.

The sum of three consecutive odd integers is 18 less than five times the middle number. Find the three integers.

Continue onto the back.

For each of the following inequalities, determine if it is true or false for the given value of the replacement variable.

$$2x + 4 > 4x - 1 \text{ for } x = 1$$

$$3x + 2 \leq 2x - 5 \text{ for } x = 8$$

$$\frac{2(3-2x)}{5} \leq 2x - 3(x+1) \text{ for } x = -1$$

Write True or False under each inequality statement.

(a) $3 > -4$

(b) $-5 > -3$

(c) $0 > -6$