

7.1 Inequalities

MATH 7

Write your questions here!



$>$

$<$

\geq

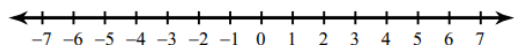
\leq

\neq

Inequality: $x > 4$

Expressed in Words:

Graphed on Number Line:

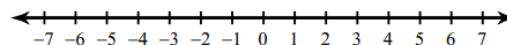


Possible Solutions:

Inequality: $n \leq 2$

Expressed in Words:

Graphed on Number Line:



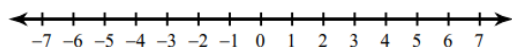
Possible Solutions:

Open dot means

Closed dot means

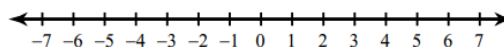
Graph the following inequalities.

$x \geq -4$



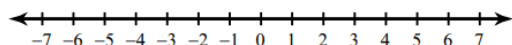
Is $x = 2$ a solution?

$y < 1$



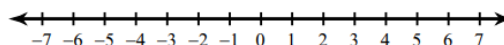
Is $y = 0$ a solution?

$3 \leq t$



Is $t = 1$ a solution?

$n \neq 2$

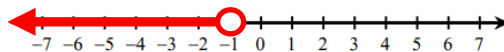


Is $n = -5$ a solution?

Write the inequality (use x as your variable).



Is $x = 2$ a solution?



Is $x = -1$ a solution?

SUMMARY:

Now, summarize your notes here!



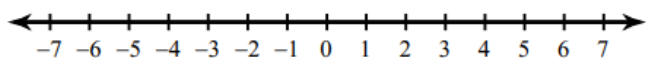
Use the inequality to express in words, graph on the number, and select values that are in the solution set.

1.

Inequality: $x < 6$

Express in words:

Graph on number line:



Circle all values of x that make the inequality true:

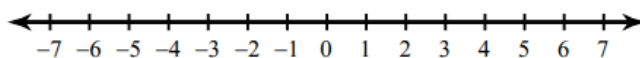
$x = 8$ $x = 2$ $x = 6$ $x = -4$

2.

Inequality: $n \geq -2$

Express in words:

Graph on number line:



Circle all values of n that make the inequality true:

$n = 3$ $n = 0$ $n = -5$ $n = -2$

Use the verbal to write the inequality, graph on the number, and select values that are in the solution set.

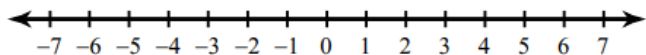
3.

Inequality:

Express in words:

y is a number greater than five

Graph on number line:



Circle all values of y that make the inequality true:

$y = 8$ $y = 2$ $y = 5$ $y = -4$

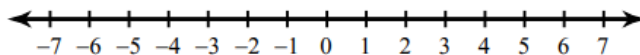
4.

Inequality:

Express in words:

h is a number less than or equal to one

Graph on number line:



Circle all values of h that make the inequality true:

$h = 3$ $h = 0$ $h = -5$ $h = 1$

Use the number line to write the inequality, express in words, and select values that are in the solution set.

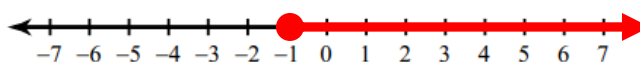
5.

Inequality:

(use x as the variable)

Express in words:

Graph on number line:

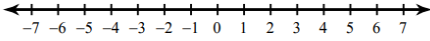


Circle all values of x that make the inequality true:

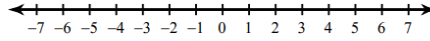
$x = 3$ $x = 0$ $x = -5$ $x = -1$

Rewrite the inequality so that the variable is on the left side. Then graph on the number line.

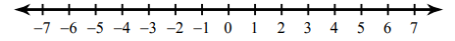
6. $3 > x$



7. $-4 \leq y$

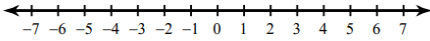


8. $0 < h$



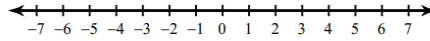
Graph the inequalities on the number line. Determine if the point is in the solution set.

9. $x > 4$



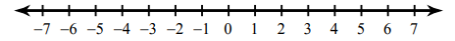
Is $x = 5$ in the solution set?

10. $g \leq -5$



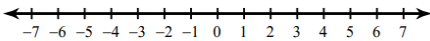
Is $g = 0$ in the solution set?

11. $t < 1$



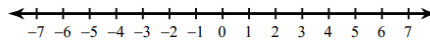
Is $t = 3$ in the solution set?

12. $6 \leq n$



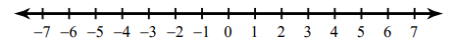
Is $n = -2$ in the solution set?

13. $-3 \geq b$



Is $b = -3$ in the solution set?

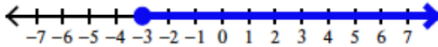
14. $p \neq 2$



Is $p = 4$ in the solution set?

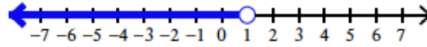
Write an inequality for each graph (use n as your variable). Determine if the point is in the solution set.

15.



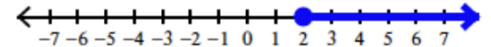
Is $n = 5$ in the solution set?

16.



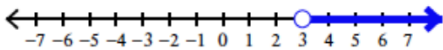
Is $n = 1$ in the solution set?

17.



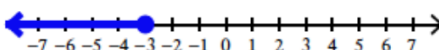
Is $n = 0$ in the solution set?

18.



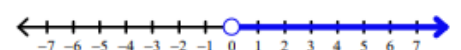
Is $n = 6$ in the solution set?

19.



Is $n = -5$ in the solution set?

20.

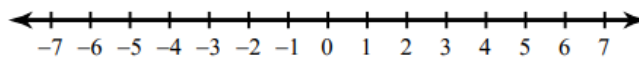


Is $n = 3$ in the solution set?

1. Use the inequality to express in words, graph on the number, and select values that are in the solution set.

Inequality: $-2 \geq x$

Graph on number line:



Express in words:

Circle all values of x that make the inequality true:

$x = 3$ $x = 0$ $x = -5$ $x = -2$

Circle the words that make the sentences true.

2. When graphing the inequality $n > 6$ on the number line you would use an

open circle and shade to **left**
closed circle and shade to **right**

3. The inequality $p \leq 6$ means that p is

**greater than or
equal to**

6 and you would

include

6 in the solution set.

**less than or
equal to**

exclude

EXIT TICKET –

Write an inequality for each situation and give two possible values that make the inequality true.

- a. The school bus can hold at most 48 people.

Inequality:

Two possible solutions:

- b. Students must have at least a 3.6 GPA to be on the honor roll.

Inequality:

Two possible solutions:

- c. Baskin Robbins has more than 30 flavors of ice cream.

Inequality:

Two possible solutions:

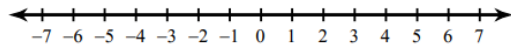
7.2 Solve Inequalities

MATH 7

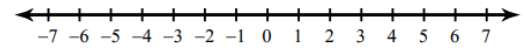
Write your questions here!



Equation
 $2x + 1 = 9$

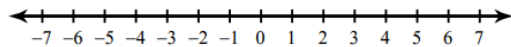


Inequality
 $2x + 1 > 9$

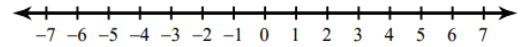


Solve the inequality and graph the solution set on the number line.

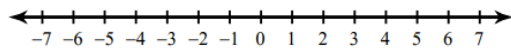
$3x - 5 \geq -8$



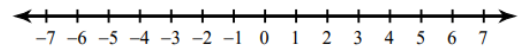
$4 > \frac{y}{3} + 6$



$11 \leq 5 + 2t$



$\frac{4n + 2}{9} \neq 2$



SELECT ALL values of x makes $4x - 1 > 11$ a true statement?

- (A) $x = 2$
- (B) $x = 3$
- (C) $x = 4$
- (D) $x = 5$

SUMMARY:

Now, summarize your notes here!

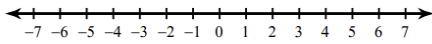


7.2 Solve Inequalities

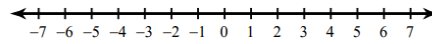
PRACTICE

Solve the following inequalities and graph the solution set on the number line.

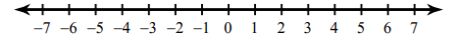
1. $3x + 5 > -1$



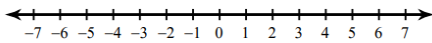
2. $-6 \leq 2y + 4$



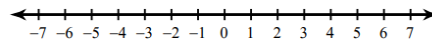
3. $\frac{h}{3} - 5 < -7$



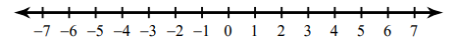
4. $x + 5 > 2$



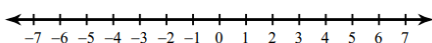
5. $-12 \leq 3g$



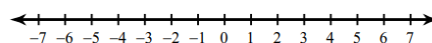
6. $\frac{2}{3}t + 4 < 2$



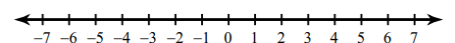
7. $7 \leq 3n + 5 + 2$



8. $2(b + 4) \geq 10$

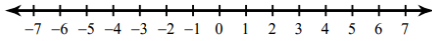


9. $3p + 4 \neq 13$

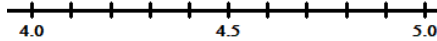


Solve the following inequalities and graph the solution set on the number line.

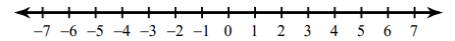
10. $3 > \frac{2x+3}{5}$



11. $3.1 + 2.5m \leq 13.6$



12. $3(2h + 1) - 4 < 23$



SELECT ALL

13. Select all values of x that make $4x + 3 \leq 11$ a true statement.

- (A) $x = 0$
- (B) $x = 1$
- (C) $x = 2$
- (D) $x = 3$

14. Select all values of n that make $\frac{n}{2} + 5 > 7$ a true statement.

- (A) $n = 2$
- (B) $n = 4$
- (C) $n = 6$
- (D) $n = 8$

15. Select all values of x that make $-11 \geq 3x + 4$ a true statement.

- (A) $x = -3$
- (B) $x = -4$
- (C) $x = -5$
- (D) $x = -6$

16. Select all values of y that make $\frac{1}{3}y - 5 \neq -3$ a true statement.

- (A) $y = -3$
- (B) $y = 0$
- (C) $y = 3$
- (D) $y = 6$

Translate to an inequality.

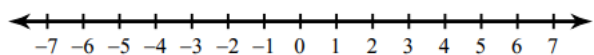
17. The quotient of a number d and four is greater than six.

18. The sum of 5 and a number n is less than or equal to 7.

19. Twice a number increased by two is at least twelve.

1. Solve the inequality and graph the solution set on the number line.

$$3x + 5 \geq -13$$



2. Select all values of x that make $8 + \frac{1}{3}x < 5$ a true statement.

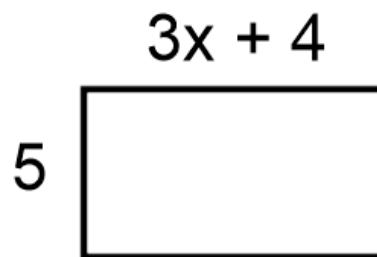
- (A) $x = -3$
 (B) $x = -6$
 (C) $x = -9$
 (D) $x = -12$

3. The perimeter of the rectangle shown below is less than 48 feet.

Part A

Which inequality represents the perimeter of the rectangle?

- (A) $5 + 3x + 4 < 48$
 (B) $5 + 3x + 4 > 48$
 (C) $10 + 6x + 8 < 48$
 (D) $10 + 6x + 8 > 48$



PART B

Solve the inequality.

PART C

Which of the following are possible values of x that would make the inequality true?

$x = 2$

$x = 8$

$x = 5$

$x = 3$

EXIT TICKET –

Write an inequality for each situation and give two possible values that make the inequality true.

- a. Donuts cost 2 dollars each. Ted spent less than 20 dollars. How many donuts did Ted buy?

Inequality:

Two possible solutions:

- b. Keri has 8 dollars. She makes 3 dollars every hour she works. Keri has more than 50 dollars. How many hours did she work?

Inequality:

Two possible solutions:

7.3 Solve Negative Inequalities

MATH 7

Write your questions here!

Fill in each circle with the correct inequality.

ADD

$$8 \bigcirc 4$$

Add 5 to both sides

$$_ \bigcirc _$$

SUBTRACT

$$8 \bigcirc 4$$

Subtract 3 from both sides

$$_ \bigcirc _$$

MULTIPLY

$$8 \bigcirc 4$$

Multiply both sides by 3

$$_ \bigcirc _$$

DIVIDE

$$8 \bigcirc 4$$

Divide both sides by 2

$$_ \bigcirc _$$

OH NO!!!

$$8 \bigcirc 4$$

MULTIPLY BY A NEGATIVE 3

$$_ \bigcirc _$$

$$8 \bigcirc 4$$

DIVIDE BY A NEGATIVE 2

$$_ \bigcirc _$$

When you multiply or divide by a negative number you must

Will the inequality flip?

$$x - 2 \geq 8$$

$$-2x \geq 4$$

$$-4 > \frac{y}{3}$$

Solve the inequality.

$$-3x - 5 \geq 19$$

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

$$4 > 6 - \frac{y}{3}$$

SUMMARY:

Now, summarize your notes here!

7.3 Solve Negative Inequalities

PRACTICE

If you were to solve the following, would you flip the inequality? Circle the correct response.

1. $x + 5 > -1$

YES the inequality flips!

or

NO the inequality would NOT flip!

2. $6 \leq -2y$

YES the inequality flips!

or

NO the inequality would NOT flip!

3. $-\frac{h}{4} < -7$

YES the inequality flips!

or

NO the inequality would NOT flip!

4. $-5 > y - 1$

YES the inequality flips!

or

NO the inequality would NOT flip!

5. $5t \leq -20$

YES the inequality flips!

or

NO the inequality would NOT flip!

6. $6 < -\frac{1}{3}n$

YES the inequality flips!

or

NO the inequality would NOT flip!

Solve the following inequalities.

7. $4x + 7 > -1$

8. $-6 \leq -2y - 8$

9. $-\frac{h}{3} + 5 < 7$

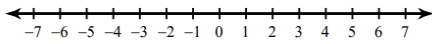
10. $x + 5 > -2$

11. $-12 \leq -3g$

12. $5 - \frac{2}{3}t < 9$

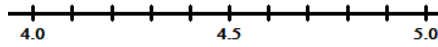
Solve the inequality and graph the solution set on the number line. Determine if the point is in the solution set.

13. $-3 > \frac{2x-3}{5}$



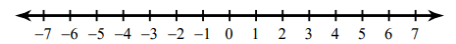
Is $x = 5$ in the solution set?

14. $3.1 - 2.5m \leq -8.4$



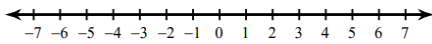
Is $m = 4.8$ in the solution set?

15. $-3(2h + 1) < 21$



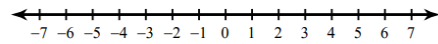
Is $h = 0$ in the solution set?

16. $12 \leq 4 + 2 - 3n$



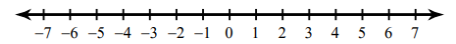
Is $n = -4$ in the solution set?

17. $30 \geq -10x$



Is $x = 5$ in the solution set?

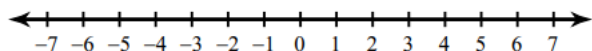
18. $3p + 4 > -14$



Is $p = 0$ in the solution set?

1. Solve the inequality and graph the solution set on the number line.

$$5 - 9x \geq -13$$



2. When solving the following, would you flip the inequality?

$$3x \geq -15$$

3. Mr. Kelly has 80 dollars. He spends 4 dollars every day on a Caramel Latte Mathiatto at Starbucks. Mr. Kelly always likes to have at least 20 dollars on him. How many days can Mr. Kelly buy a Caramel Latte Mathiatto and still have at least 20 dollars leftover?

Part A

Which inequality represents Mr. Kelly's money?

- (A) $20 - 4d < 80$
 (B) $20 - 4d > 80$
 (C) $80 - 4d < 20$
 (D) $80 - 4d > 20$

PART B

Solve the inequality.

PART C

Which of the following are possible values of d that would make the inequality true?

$$d = 12$$

$$d = 15$$

$$d = 20$$

$$d = 21$$



EXIT TICKET –

Mr. Sullivan solved the following inequality incorrectly. Help a math teacher out and find his mistake!

$$\begin{array}{r}
 5 + 3x \geq -10 \\
 \underline{-5} \qquad \qquad \underline{-5} \\
 3x \geq -15 \\
 \underline{\quad} \quad \underline{\quad} \\
 x \leq -5
 \end{array}$$

7.4 Modeling with Inequalities

MATH 7

Write your questions here!



Equation

The sum of a number and six is negative twelve

Inequality

The sum of a number and six is less than negative twelve

Key Words!

$>$
More than
Greater than
Larger than
Above

\geq
At least
Not less than
Minimum

$<$
Less than
Smaller than
Below

\leq
At most
Not more than
Maximum

Write an inequality to represent the following.

French Club is raffling a basket of French goodies for a fundraiser. Tickets for the raffle sell for \$2. The club spent \$20 to make the basket. How many tickets do they need to sell in order to make more than \$200?

Mr. Kelly is having a Math Day party. He can spend no more than 300 dollars. He spent 25 dollars on coca cola classics and wants to buy as many 10 dollar pizzas as he can. How many pizzas can he buy?

Bring the Pain!

Sully has 12 followers on Insta. He gets 4 new followers every day. How long will it take for him to have at least 100 followers on Insta?

Inequality

Variable and what it represents

Solution

Graph of the solution set

SUMMARY:

Now, summarize your notes here!



Sentence explaining the solution.

Multiple Choice. Select the inequality that represents the situation.

1. Twice a number increased by seven is greater than four.

(A) $n + 2 + 7 < 4$
(B) $2n + 7 < 4$
(C) $n + 2 + 7 > 4$
(D) $2n + 7 > 4$

2. When 12 is subtracted from 3 times a number, the result is no more than 24.

(A) $12 - 3n \leq 24$
(B) $3n - 12 \leq 24$
(C) $3n - 12 < 24$
(D) $12 - 3n < 24$

3. Jake has 8 cupcakes. He makes 12 cupcakes every hour. He plans to bake until he has at least 48 cupcakes.

(A) $8h + 12 \geq 48$
(B) $8h + 12 > 48$
(C) $8 + 12h \geq 48$
(D) $8 + 12h > 48$

4. Saundra has 50 dollars to spend on souvenirs. She buys a magnet for \$2.50 and 6 keychains for her friends. The keychains are all the same price. How much are the keychains?

(A) $50 \geq 2.50 + 6k$
(B) $50 \leq 2.50 + 6k$
(C) $50 \geq 6k - 2.50$
(D) $50 \leq 6k - 2.50$

5. Anthony went to the hobby shop and bought 2 model airplanes at \$8.95 each and some paints. If he spent more than \$23.65, what was the cost of the paints? Include an equation to represent this.

(A) $2 + 8.95 > 23.65p$
(B) $2(8.95) + p > 23.65$
(C) $8.95 + 2p > 23.65$
(D) $2p + 8.95 > 23.65$

6. Kendra is buying bottled water for a class trip. She has 18 bottles left over from the last trip. She buys bottles by the case to get a good price. Each case holds 24 bottles. How many cases will she have to buy if she wants to have more than 160 bottles of water?

(A) $24 + 18 > 160c$
(B) $c > 160 - 24 - 18$
(C) $24c + 18 > 160$
(D) $24 + 18c > 160$

Create an inequality to model the following. Solve your inequality. SHOW ALL STEPS!

7. The quotient of a number and three increased by 12 is no more than 20. What is the number?

Inequality:

Solution:

8. Five increased by product of a number and three is greater than 23. What is the number?

Inequality:

Solution:

9. The product of negative two and a number decreased by four is at least thirty-six. What is the number?

Inequality:

Solution:

10. The local flea market charges the vendors a flat rate of \$25 plus \$5 for each hour that they spend at the market. If the vendor owed at least \$60, how many hours did he remain at the flea market?

Inequality:

Variable and what it represents:

Solution:

Sentence explaining the solution:

11. Mr. Kelly starts the day off with 49 Jolly Ranchers. He eats 6 Jolly Ranchers every hour. He wants to have at least 4 Jolly Ranchers left over for his kids. How long can he eat Jolly Ranchers for?

Inequality:

Variable and what it represents:

Solution:

Sentence explaining the solution:

12. A cellphone company charges \$19 plus \$0.25 for each text message sent. The total bill was greater than \$47.50. How many text messages were sent?

Inequality:

Variable and what it represents:

Solution:

Sentence explaining the solution:

1. Andre has \$650 in a savings account at the beginning of the summer. He wants to have at least \$200 in the account by the end of the summer. He withdraws \$25 each week for food and entertainment. How many weeks will his money last?

Inequality

Variable and what it represents

Solution

Sentence explaining the solution.

2. Katelyn would like to have some bracelets made for her friends. A bracelet maker charges a flat rate of \$4, plus \$0.75 per bracelet. Katelyn has saved \$29 to for the bracelets. How many bracelets can she get?

Part A

Write an inequality where b stands for the number of bracelets Katelyn can get.

PART B

Solve the inequality.

PART C

Which of the following are possible values of b that would make the inequality true?

$$b = 20$$

$$b = 25$$

$$b = 30$$

$$b = 35$$

EXIT TICKET –

Jamal rents a car for one day. The charge is \$30 plus the \$0.15 per mile. He spent no more than \$90.
He writes the inequality below to represent this.

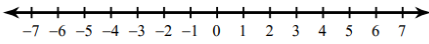
$$30m + 0.15 < 90$$

Is his inequality correct? Explain why or why not.

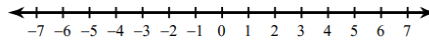
REVIEW

Graph the inequalities on the number line.

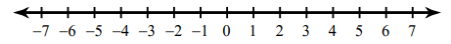
1. $x > -2$



2. $g \leq 3$

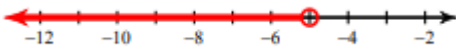


3. $4 < t$



Write an inequality to represent the solution set.

4.



5.



6.

x is a number no greater than 4

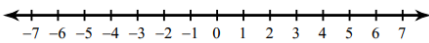
Select all of the following that are solutions to the inequality.

7. $x > -2$

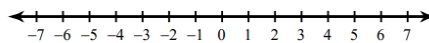
- (A) $x = 4$
- (B) $x = -4$
- (C) $x = 2$
- (D) $x = -2$
- (E) $x = 0$

Graph the inequalities on the number line.

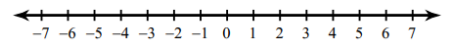
8. $4 - 3x > 19$



9. $\frac{g}{3} - 5 \leq -7$



10. $14 < 2(3x - 5)$



Write an inequality to model the following. State what your variable represents.

11. There are at least 9 Star Wars movies.

Inequality

Variable

12. Bob has 30 lightsabers. He gets 4 lightsabers every week. He plans to collect lightsabers until he has more than 180 lightsabers. How long will he collect lightsabers.

Inequality

Variable