

inequality - a mathematical sentence that states that two expressions are NOT equal

inequality symbol - symbol used to compare both sides of an inequality $<$, $>$, \leq , \geq

solution set - a list of values that make an inequality true $\{x, y, z \dots\}$

Translating inequality word phrases

Algebraic Phrase	Algebraic Inequality	Solutions
1. a number is less than 4.	$x < 4$	{3, 2, 1...}
2. a number is more than 4.	$x > 4$	{5, 6, 7...}
3. -4 is less than a number.	$-4 < x$	{-3, -4, -5...}
4. -4 is greater than a number.	$-4 > x$	{-5, -6, -7...}
5. Jason has at least five dollars.	$d \geq 5$	{5, 6, 7...}
6. The highest grade you can get is a ninety-five.	$g \leq 95$	{95, 94, 93...}

TOPIC:
Solving
Inequalities

Lesson Essential Question:

How can we model real life situations to solve an inequality?

**SOLVING
One-Step
Inequalities**
(REVIEW from
6th Grade)

EXAMPLE:
1) DRAW your RIVER (a line to separate left-side from the right-side.)

2) Perform inverse (or opposite) operation.

3) Box your final answer.

4) Create Solution Set

$$x + 8 < 21$$

$$\boxed{x} + 8 < 21$$

$$\boxed{x} + 8 < 21$$

$$- 8 < - 8$$

$$\boxed{x < 13}$$

$$\{12, 11, 1\}$$

$$3x \leq 21$$

$$3x \leq 21$$

$$\frac{3x}{3} \leq \frac{21}{3}$$

$$\boxed{x \leq 7}$$

$$\{7, -6, 2\}$$

****ALWAYS CHECK****

Does my answer make sense?

DID MY ANSWER HAVE???

■ VARIABLE TERM ■ an INEQUALITY SIGN ■ CONSTANT

When multiplying or dividing by a negative,
switch the inequality symbol to its opposite.

EXAMPLE: $-3x \geq 21$ **EXAMPLE:** $8 - x > 20$

CHECK:

Solution Set:

Solution Set:

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Lesson Essential Question:

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SOLVING
Two-Step
Inequalities

EXAMPLE:

$$-x + 8 > 21$$

1) DRAW your RIVER (a line to separate left-side from the right-side.)

$$\boxed{-x} + 8 > 21$$

2) Perform inverse (or opposite) operation.

$$\boxed{-x} + 8 > 21$$

$$\underline{-8} \quad \underline{-8}$$

3) Flip the symbol.

$$\underline{-x} > \underline{13}$$

$$\underline{-1} \quad \underline{-1}$$

4) Box your final answer.

$$\boxed{x < -13}$$

5) Check your answer.

CHECK

(choose a possible solution)



****ALWAYS CHECK your answer. Does it make sense?**

DID MY ANSWER HAVE???

■ VARIABLE TERM ■ an INEQUALITY SIGN ■ CONSTANT

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SOLVING
Two-Step
Inequalities

EXAMPLE:

1) DRAW your RIVER (a line to separate left-side from the right-side.)

$$\frac{-3x}{5} \geq \frac{15}{5}$$
$$\frac{-3x}{5} \geq 15$$

2) Perform inverse operations.

$$5 \frac{-3x}{5} \geq \frac{15}{5} 5$$

3) Flip the symbol.

$$\frac{-3x}{-3} > \frac{75}{-3}$$

4) Box your final answer.

$$x \leq -25$$

5) Check your answer.

CHECK

(choose a possible solution)



DID MY ANSWER HAVE???

■ VARIABLE TERM ■ an INEQUALITY SIGN ■ CONSTANT

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SOLVING
Two-Step
Inequalities

EXAMPLE: $\frac{x - 3}{4} \geq 1$

1) **DRAW** your river.

$$4 \frac{x - 3}{4} \geq 1 \quad 4$$

2) Perform inverse operations.

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

3) **Box** your final answer.

$$x \geq 7$$

4) Check your answer.

CHECK:

Solution Set:

DID MY ANSWER HAVE???

■ VARIABLE TERM ■ an INEQUALITY SIGN ■ CONSTANT

graph of an inequality - a number line that shows the solution to an inequality, since there are infinite solutions

Two steps:

1. choose open or closed circle at first point of solution



2. choose to shade left or right



$$X < \#$$

OR

$$\# > X$$



$$X > \#$$

OR

$$\# < X$$

Solve and Graph each Inequality

Ex 1) $4x + 6 < 12$



Solve and Graph each Inequality

Ex 2) $2x - 3 - 8x \geq 21$

Solve and Graph each Inequality

Ex 3) $7(2x - 4) - 12x > -12$

SOLVE

GRAPH

$$0.5X + 40 < 50$$



$$10 - 1.5X \geq 20$$



$$\frac{X}{2} + 2.6 > 8.1$$



Suppose your parents gave you \$100 to go to Carowinds. But you want to leave the park with at least thirty dollars to go to Red Lobster with friends afterwards. Each ride cost \$3.50. How many rides can you ride and still leave with at least \$30 for dinner ?


I

- \$___ to start with
- r = the number of rides
- Cost of rides:
- \$___ you'd like to have after r rides.

P

- inequality symbol:
- inequality:
- steps to solve:

S

- I can go on  rides in order to have at least \$30 left for dinner.

Suppose your parents gave you \$100 to go to Carowinds. But you want to leave the park with at least \$30 in your pocket to go to Red Lobster with some friends. Each ride cost \$3.50. How many rides can you ride and still leave with at least \$30 for dinner afterwards?

- Suppose you rode twenty-five rides. How much money would you still need?

$$100 - 3.50r \geq 30$$

- Suppose you rode nineteen rides. How much money would you have left over?

$$100 - 3.50r \geq 30$$

- What is the greatest number of rides that you can go on and still have thirty dollars left for dinner? Explain.

Problem solving:

Online concert tickets cost \$38.95 each, plus a service charge of \$2.55 per ticket. The website also charges a transaction fee of \$12.99 for the purchase. If you paid \$332, how many tickets did you buy?

A) Write a multi-step equation

B) Solve



Problem solving:

Calvin bought 3 pairs of jeans for \$21 each and 2 shirts. He spent a total of \$82 before tax. What was the cost of 1 shirt?

A) Write a multi-step equation

B) Solve



Exit Ticket:

Elvin bought 3 shirts for \$19 each and 2 pair of jeans . He didn't want to spend more than \$68 before tax. What was the cost of one pair of jeans?

- A) Write the inequality**
- B) Solve**
- C) Write the solution set**
- D) Graph**