Warmup 8/(*Solution of* $\frac{1}{11}x = 2$)

Fill in the blank with either < or >.

1) 10__12
2) −4__−6
3) $\frac{1}{4}$ __ $\frac{1}{3}$
4) 2^3 __ 3^2

5) Write 4 numbers that satisfy the inequality $x < 3$.

Purple Chair Reward

- I will select one random person – that person gets to sit in the purple chair all week!
- To be eligible, you need to have done ALL your homework the previous week, or not been penalized for forgetting materials or talking, etc.
- You are responsible for getting the chair and returning it to its spot by my desk each period.
- If you did not win the purple chair, **you may not sit in it!!!**

Quizzes…

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Today's Objectives

- Understand the similarities and differences between solving **equations** and **inequalities**
- Graph the solution set of an inqeuality

SUPER, SUPER IMPORTANT

- It is crucial to know the difference between an equation and an inequality. Saying "one has an equal sign, one has < or >" is not enough.
- Solution to **x = 8**?
- Solution to **x > −4**?

Differences between equations and inequalities

- **Discuss with your group:**
- How many solutions do equations have?
- How many solutions do inequalities have?
- **Inequality symbols:** $<, >, \leq, \geq, \neq$

Find 3 solutions for each inequality:

1. $x + 3 < 12$
2. $x - 10 \geq 34$
3. $\frac{x}{5} \leq 4$
4. $-3x > 12$

Describe the solutions in words:

1) $x + 3 < 12$
"Numbers that are less than 9"

2) $x - 10 \geq 34$
"Numbers that are greater than or equal to 44"

3) $\frac{x}{5} \leq 4$
"Numbers that are less than or equal to 20"

4) $-3x > 12$
"Numbers that are less than –4"

Ok…how do we officially solve them?

- **THREE VOLUNTEERS PLEASE!!!**
- **Each one gets a whiteboard. Stand in a line in front of the class.**
- **First person: write "1" on the whiteboard.**
- **Middle person: write "<" on the whiteboard.**
- **Last person: write "2" on the whiteboard.**

1. Both people: add 5 to both sides.
2. Is the inequality sign correct?
3. Subtract 10 from both sides.
4. Is the inequality sign correct?
5. Multiply both sides by 4.
6. Is the inequality sign correct?
7. Divide both sides by –2.
8. Is the inequality sign correct?
9. Divide both sides by 4.
10. Is the inequality sign correct?
11. Add –5 to both sides.
12. Is the inequality sign correct?
13. Multiply both sides by –10.
14. Is the inequality sign correct?
15. Subtract –8 from both sides.
16. Is the inequality sign correct?

WHEN DO WE HAVE TO CHANGE THE DIRECTION OF THE SIGN???????

Solving Inequalities

Keep the sign the same when:
- Adding or subtracting anything on both sides
- Multiplying or dividing both sides by a positive number

Reverse the sign when:
- Multiplying or dividing both sides by a negative number

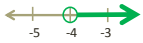
I know I keep saying this, but…

You will do much better with this rule if you try to understand WHY it works than if you just memorize it. Think back to the three people with whiteboards to help you remember the concept behind this rule!

Solve and graph the solution set.

$5x > -20$

$x > -4$

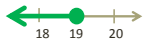


Graphing Inequalities

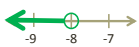
- Rules for Graphing
- **Closed dot**: ≥ **or** ≤ (means that value is a solution)
- **Open dot**: > **or** < (means that value is not a solution)

Solve and graph the solution set.

1. $5x - 4 \leq 91$ $x \leq 19$



2. $20 - \frac{3}{2}x > 32$ $x < -8$



3. $18 - 3(2x - 4) < 6$ $x > 4$

4. $14 - (-10) \geq 6x - 4 + x$ $4 \geq x$

Homework

- pg. 78 (8–20) even