BRING YOUR TEXTBOOK!!!

Warmup $8/(9 + 10 + 2)$

Whoops! Wednesday

Aaron and Alice are bowling. Alice's score is twice the difference of Aaron's score and 5. The sum of their scores is 320. What is Aaron's score?

$$2(a - 5) = 320$$

$$2a - 10 = 320$$

$$2a = 330$$

$$a = 165$$

Find and correct the mistake in the student's work.

If you haven't taken the enrichment survey yet…

- **PLEASE remember to do so today!!! (If you can multi-task, you may do it now)**

- DeBoard, Zilah
- Komisar, Jack
- Mohammad, Helen
- Robertson, Isabelle
- Singha, Abhi
- Waterman, Jenalyse

Lischwe Age Problem, Part 2

- Nate's age + Anne's age = 67
- 26 years ago, Nate was twice as old as Anne.

Go over the quiz?

Today's Objectives

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

Add to your table of contents…

Table of Contents

Inequalities

Objectives:

-**Understand the differences between equations and inequalities**

-**Solve inequalities**

-**Graph the solution set of an inequality**

Fill in the blank with either < or >.

1) $10 \underline{\leq} 12$

2) $-4 \underline{\geq} -6$

3) $\dfrac{1}{4} \underline{\leq} \dfrac{1}{3}$

4) $2^3 \underline{\leq} 3^2$

5) Write 4 numbers that satisfy the inequality

$x < 3.$ $-18, 0, 2, 2.8$

Worksheet

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:**

- How many solutions do equations have?

  one (usually)

- How many solutions do inequalities have?

  infinite!

- **Inequality symbols:** $<, >, \leq, \geq, \neq$

Find 3 solutions for each inequality:

1. x + 3 < 12   6, 7, 8

2. x − 10 ≥ 34   44, 50, 700

3. $\frac{x}{5} \leq 4$ 0, 5, 20

4. -3x > 12   −5, −6, −7

Describe the solutions in words:

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

2) x − 10 ≥ 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 <u>officially</u> 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
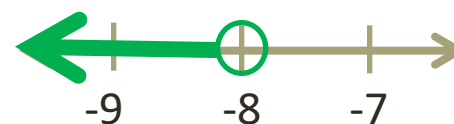
Reverse the sign when:

- Multiplying or dividing both sides by a negative number

Solve and graph the solution set.

1. $20 - \frac{3}{2}x > 32$

$x < -8$

$-20 \qquad -20$

$\left(-\frac{2}{3}\right) - \frac{3}{2}x > 12\left(-\frac{2}{3}\right)$

$x < -8$

2. $14 - (-10) \geq 6x - 4 + x$

$4 \geq x$

$24 \geq 7x - 4$

$+4 \qquad +4$

$\frac{28}{7} \geq \frac{7x}{7}$

$4 \geq x \text{ or } x \leq 4$
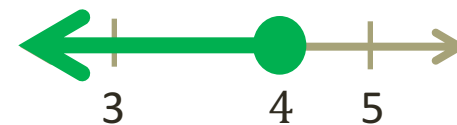
Remember: Graphing Inequalities

- <u>Graphing Inequalities</u>
- **Closed dot**: $\geq$ **or** $\leq$ (means that value <u>is</u> a solution)
- **Open dot**: $>$ **or** $<$ (means that value <u>is not</u> a solution)

Homework

- **p. 78 (7-10, 13-18)**
- *****Graph all solutions!!!*****

- Some of the answers WILL include fractions.
- There is not a ton of room – use a separate sheet of paper if necessary!