Algebra 1 Week 7 Block   Warm Up

1. Skill 1: Solve an Equation

$2(4s - 5) = 3(6 - 2s)$

2. Skill 2: Proportional Reasoning

In the past two years, a retailer has opened 232 stores. If the rate of growth remains the constant, how many stores will open in the next 3 years.

3. Solve for y: $3y - 27x = 33$

Skill 3: Solve and graph compound inequalities:

4. Solve the inequality and graph the answer on a number line. $-9 + 2a \leq 3a$

5. Solve the absolute value:

$$|x + 5| = 3$$

6. Your friend is selling 5 tickets to the next ice hockey game for $80.00. You can buy 3 tickets online for $50.00. Which source offers the best price. Show work and explain in writing.

7. A toad travels 10miles/per day. How far will it travel in 5 hours?

Wk 7 Block   **CW**   Absolutely Less

Answer each question below:

1. True or False?
   a. $|1| < 2$ b. $|-3| < 2$ c. $|-1| < 2$ d. $|0| < 2$

2. Circle numbers in the set S that can be substituted for x to make the inequality $|x| < 2$ true.
   $$S = \{-3, -2.75, -2, -1.33, -1, 0, 0.5, 1, 1.99, 2, 2.66, 3\}$$

3. Circle numbers in the set S that can be substituted for y to make the equation $|y| \le 2$ true.
   $$S = \{-3, -2.75, -2, -1.33, -1, 0, 0.5, 1, 1.99, 2, 2.66, 3\}$$

Every absolute value inequality with < or ≤ represents _two_ inequalities combined with "and":

$$|x| < 2 \text{ means that } x < 2 \underline{\text{ and }} x > -2 .$$

It means $x < 2$ because for numbers less than 2, the absolute value will be less than 2: $|1| < 2$

It means $x > -2$ because for numbers greater than –2, the absolute value will be less than 2: $|-1| < 2$

The numbers that work in $|x| < 2$ must meet <u>both</u> of these requirements:

-1.7 works because it is less than 2 <u>and</u> greater than –2, so $|-1.7| < 2$ is a true statement.

-3 does not work, even though it is less than 2, because it is not greater than –2, so $|-3| < 2$ is not true.

Use the principle above to fill in the blanks for each question.

4. $|x| \le 5$ means $x \le 5$ and   _____

5. $|x| < 250$ means   _____   and   _____

6. $|x + 3| < 5$ means   _____   and   _____

7. $|2x| - 1 \le 9$ changes to _____ which means _____ and _____

Skill 4: Solve absolute value inequalities

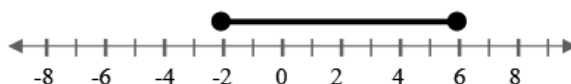To solve absolute value inequalities, solve the two inequalities that each represents.

For example, to solve $|y - 2| \le 4$:

$$|y - 2| \le 4 \text{ means } y - 2 \le 4 \text{ and } y - 2 \ge -4$$

$$\begin{array}{cc} +2 \ +2 & +2 \ \ +2 \\ \hline y \ \ \ \le 6 & y \ \ \ \ge -2 \end{array}$$

The solution set is $y \le 6$ _and_ $y \ge -2$, which is the same as $-2 \le y \le 6$.

The graph of this solution set looks like:

Check $x = 5$:   Is $|5 - 2| \le 4$?   Check $x = -3$:   Is $|-3 - 2| \le 4$?

            $|3| \le 4$ Yes. $|-5| \le 4$ No.

   ($x = 5$ is in solution set.)   ($x = -3$ is not in solution set.)
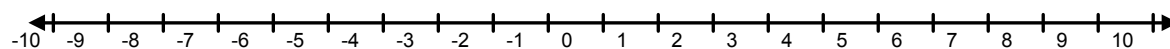

Use this principle to solve each absolute value inequality, graph the solution set, and on even problems check 2 values – one in the solution set and one not in the solution set.
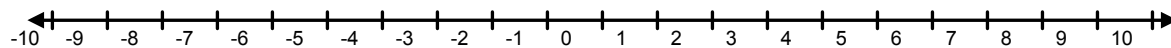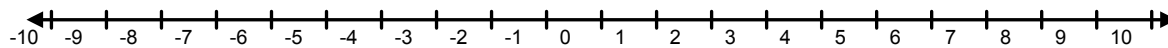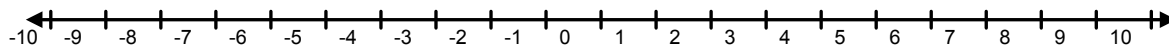
8. $\left| 2x + 5 \right| \le 5$
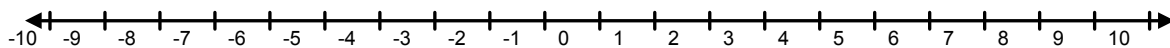
9. $\left| 4y - 8 \right| < 0$

10. $\left| 2 - y \right| \le 1$

11. $3 \left| e - 2 \right| < 9$

12. $\left| 3x \right| + 4 < \text{-}8$

13. $\left| 8 - (w - 1) \right| \le 9$
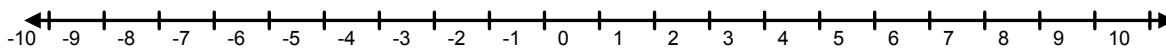
HW p 211: 23, 28, 33, 37, 43, 45

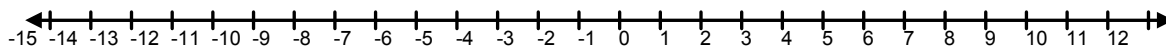**Solve each equation. If there is no solution, write *no solution*.**

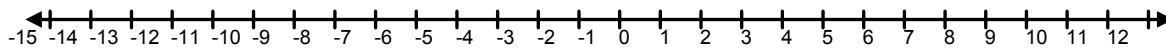Remember: 2 sticks = 2 problems

23. $3|v - 3| = 9$

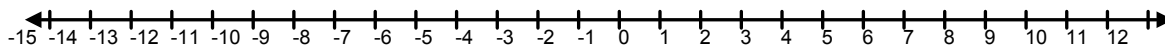**28.** $3|x + 2| + 4 = 13$

Solve and graph each inequality.

33. $|x| < 5$

```
◄─┼──┼──┼──┼──┼──┼──┼──┼──┼──┼──┼──┼──┼──┼──┼──┼──┼──┼──┼──┼──┼──┼──┼──┼──┼──┼──┼──►
 -15 -14 -13 -12 -11 -10 -9 -8 -7 -6 -5 -4 -3 -2 -1  0  1  2  3  4  5  6  7  8  9  10 11 12
```

37. $|p - 7| \leq 3$

```
◄─┼──┼──┼──┼──┼──┼──┼──┼──┼──┼──┼──┼──┼──┼──┼──┼──┼──┼──┼──┼──┼──┼──┼──┼──┼──┼──┼──►
 -15 -14 -13 -12 -11 -10 -9 -8 -7 -6 -5 -4 -3 -2 -1  0  1  2  3  4  5  6  7  8  9  10 11 12
```

43. $|2v - 1| \leq 9$

```
◄─┼──┼──┼──┼──┼──┼──┼──┼──┼──┼──┼──┼──┼──┼──┼──┼──┼──┼──┼──┼──┼──┼──┼──┼──┼──┼──┼──►
 -15 -14 -13 -12 -11 -10 -9 -8 -7 -6 -5 -4 -3 -2 -1  0  1  2  3  4  5  6  7  8  9  10 11 12
```

45. $|2f + 9| \leq 13$

```
◄─┼──┼──┼──┼──┼──┼──┼──┼──┼──┼──┼──┼──┼──┼──┼──┼──┼──┼──┼──┼──┼──┼──┼──┼──┼──┼──┼──►
 -15 -14 -13 -12 -11 -10 -9 -8 -7 -6 -5 -4 -3 -2 -1  0  1  2  3  4  5  6  7  8  9  10 11 12
```