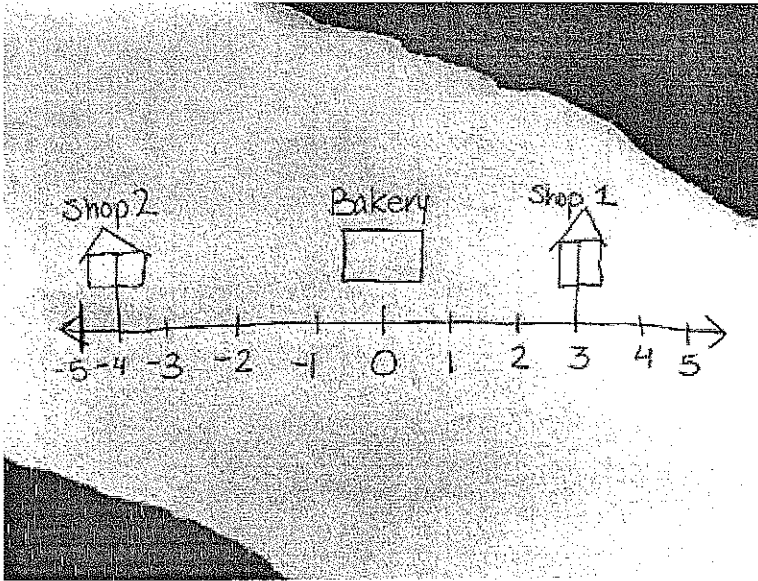


Name: \_\_\_\_\_ Date: \_\_\_\_\_ Hour: \_\_\_\_\_

## Guided Notes - Absolute Value (Part 1)

A bakery makes deliveries to two shops on the same street.



- What is the distance the delivery truck must travel from the bakery to shop 1?

- What is the distance the delivery truck must travel from the bakery to shop 2?

- Where could shop 3 be located on the number line, if it has a distance of 5 from the bakery?

5 and -5 both have the same number, but different signs. This means they have the same

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So,  $|5| = |-5| = 5$ .

What values make the following equations true?

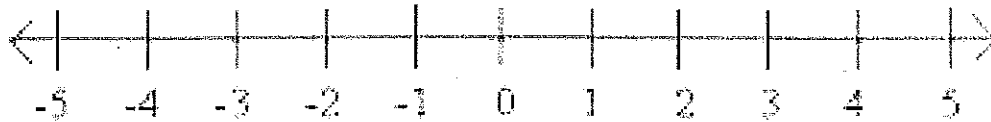
1.  $|x| = 12$

2.  $|x| = 45$

3.  $|x| = -3$

Absolute value: \_\_\_\_\_

What would  $|x - 11| = 4$  look like? What does it mean?



Try these on your own!

1)  $|x - 10| = 3$

2)  $|x - 10| = 12$

3)  $|x - 10| = 0$

4)  $|10 - x| = 3$

5)  $|x - 12| = 10$

6)  $|x - 6| = -4$

## Guided Notes - Absolute Value (Part 2)

### **Evaluating an Expression with Absolute Value**

*(Substituting a value in for the variable and simplify)*

- 1) Evaluate  $2.7 + |6 - 2x|$  if  $x = 4$ .

### **Solving an Absolute Value Equation in 3 Steps:**

- 1) Split into 2 cases:
  - a) One equation equals a positive number
  - b) One equation equals a negative number
- 2) Solve each equation for the variable
- 3) Check for extraneous solutions (Solutions that may not be actual solutions to the original equation - like if you check your solution and find it doesn't work)

Example - Two possible solutions: Solve  $|y + 3| = 8$

Example 2 - No Solutions: Solve  $|6 - 4t| + 5 = 0$

**\*\* An absolute value can \_\_\_\_\_ equal a negative number \*\***

Example 3 - One Solution: Solve  $|8 + y| = 2y - 3$

## Practice Solving Absolute Value Equations

Solve each equation.

1)  $|n| = 5$

2)  $|n| = -2$

3)  $\frac{|x|}{2} = 0$

4)  $9|r| = 45$

5)  $|n + 8| = 14$

6)  $|1 - b| = 3$

7)  $|7 - v| = 3$

8)  $|-8x| = -24$

9)  $|7m| + 2 = 37$

10)  $|-8 - n| + 8 = 8$

11)  $-10 - \left| \frac{x}{2} \right| = -15$

12)  $\frac{|-8p|}{6} = 2$

$$13) |a+1| - 7 = -5$$

$$14) 10|1+n| = 110$$

$$15) 5+9|x+5| = 104$$

$$16) -4+8|n-10| = 52$$

$$17) |m+4| + 7 = 11$$

$$18) 8|x-4| + 5 = 21$$

$$19) 8|r+10| + 6 = 102$$

$$20) 9|10n| + 3 = 93$$

$$21) 3\left|\frac{n}{9}\right| + 2 = 5$$

$$22) 10+8|-5b| = 90$$


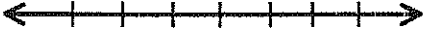

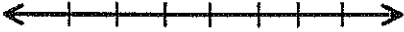

$$23) 3+3|n-4| = 3$$

$$24) 9\left|\frac{x}{6}\right| - 3 = 0$$

Name: \_\_\_\_\_ Date: \_\_\_\_\_ Hour: \_\_\_\_\_

## Guided Notes - Inequalities

With inequalities, **ALWAYS** list your variable first!

$\lt$	Meaning: less than 
$\leq$	Meaning: less than or equal to 
$\gt$	Meaning: greater than 
$\geq$	Meaning: greater than or equal to 
$\neq$	Meaning: not equal to 

Examples

1)  $x + 6 < 14$

2)  $12 - d > 8$

3)  $\frac{x}{4} \leq -7$

4)  $5y \geq -35$

**\*\* Remember, when you multiply or divide by a negative number, you have to flip the sign!\*\***

What happens if you make them negative?

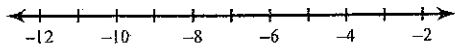
$\frac{x}{4} \leq -7$

$-5y \geq -35$

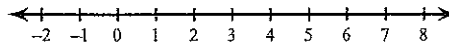
One-Step Inequalities

Solve each inequality and graph its solution.

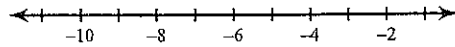
1)  $-12 > x - 7$



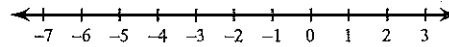
2)  $-1 + r \geq 4$



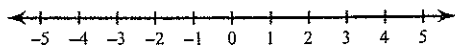
3)  $n - 6 \leq -14$



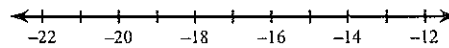
4)  $b - 7 < -12$



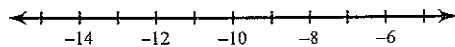
5)  $a - 17 > -16$



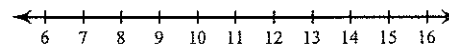
6)  $15 + x \leq 0$



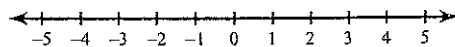
7)  $3 + v \leq -9$



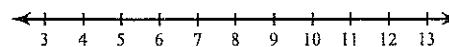
8)  $8 \geq n - 6$



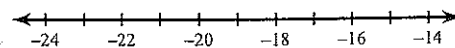
9)  $-3x > 3$



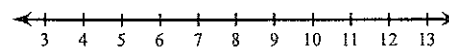
10)  $\frac{n}{3} > 3$



11)  $\frac{k}{4} < -4$

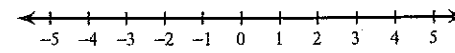


12)  $-9x \geq -90$

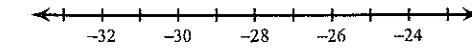




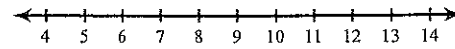
13)  $0 \geq 7n$



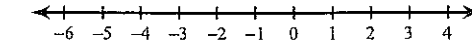
14)  $\frac{m}{5} \geq -5$



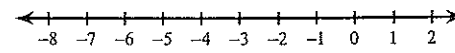
15)  $-13x < -156$



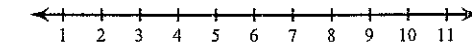
16)  $32 \geq -16p$



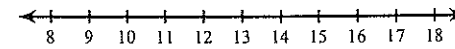
17)  $-8 > v - 3$



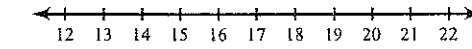
18)  $11 \leq 5 + x$



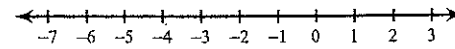
19)  $25 \geq n + 13$



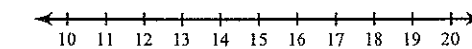
20)  $-168 > -12a$



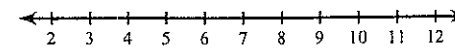
21)  $-3 \leq x - 4$



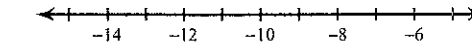
22)  $\frac{r}{3} > 6$



23)  $12n \geq 84$



24)  $-22 > -10 + b$



Name: \_\_\_\_\_ Date: \_\_\_\_\_ Hour: \_\_\_\_\_

### Solving and Graphing Inequalities in One Variable

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1	
2	
3	
4	
5	

**Example: Solve and Graph**

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

Open Circle
Closed Circle



Solve and Graph the Inequality

$$8x - 9 \geq -15$$

$$-4x - 13 > -21$$

$$s \geq \frac{s+6}{5}$$

$$\frac{k}{3} - 14 < -5$$

$$5(2x - 11) \leq -16$$

$$\frac{2x-9}{4} \leq x+2$$

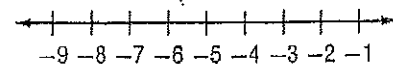
Name: \_\_\_\_\_

# 1-5 Skills Practice

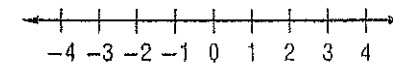
## Solving Inequalities

Solve each inequality. Then graph the solution set on a number line.

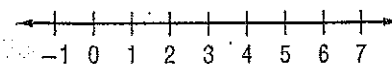
1.  $\frac{z}{-4} \geq 2$



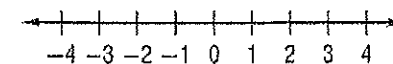
2.  $3a + 7 \leq 16$



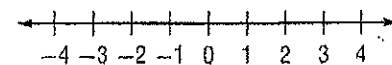
3.  $16 < 3q + 4$



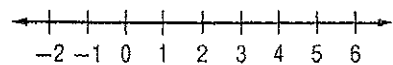
4.  $20 - 3n > 7n$



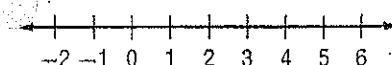
5.  $3x \geq -9$



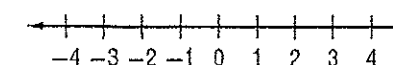
6.  $4b - 9 \leq 7$



7.  $2z < -9 + 5z$



8.  $7f - 9 > 3f - 1$



Name: \_\_\_\_\_ Date: \_\_\_\_\_ Hour: \_\_\_\_\_

### **Multi-Step Inequalities - Word Problem**

1) Danielle can hike 3 miles in an hour, but she has to take a one-hour break for lunch and a one-hour break for dinner. If Danielle wants to hike at least 18 miles, solve  $3(x - 2) \geq 18$  to determine how many hours the hike should take.

2) Jim is selling advertising space in Central City Magazine to local businesses. Jim earns 3% commission for every advertisement he sells plus a salary of \$250 a week. If the average amount of money that a business spends on advertising is \$500, how many advertisements must he sell each week to make a salary of at least \$700 that week?

a) Write an inequality to describe this situation.

b) Solve the inequality and interpret the solution.

3) Jamie wants to be able to run at least the standard marathon distance of 26.2 miles. A good rule for training is that runners generally have enough endurance to finish a race that is up to 3 times his or her average daily distance.

a) If the length of her current daily run is 5 miles, write an inequality to find the amount by which she needs to increase her daily run to have enough endurance to finish a marathon.

b) Solve the inequality and interpret the solution.