

## Unit 9 Absolute Values

### 9-1 Absolute Value Expressions

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#### Absolute Value

- A number's distance from 0 on the number line.
- Always Positive
- Acts like Grouping Symbols

*Simplify.*

1.  $|5|$

2.  $|-92|$

3.  $4 + |3 - 1|$

4.  $9 - |5 + 1|$

5.  $5|4 - 12| + 6$

## 9-2 Absolute Value Equations

Absolute Value - The distance between a number & zero on the number line.

Steps to solving Absolute Value Equations

1. Isolate the absolute value.
2. Set the equation to two parts (+ and -)
3. Solve
4. Check your work.

If an absolute value is equal to a negative number then there is no solution.

Ex.  $|x| = -15$   
 $x = \text{no real solution}$

1.  $|x| = 3$

*...this means to find which number(s) are 3 spaces away from zero*

2.  $3|x| - 4 = 2$

3.  $-2|x| + 6 = 2$

3.  $|x - 3| = 5$

Think: *The distance between x and 3 is 5 spaces*

4.  $|4p - 3| = 7$

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5.  $|2x - 3| = -9$

6.  $4|4x + 6| - 15 = 5$

7.  $5 - |x - 3| = -12$

## 9-3 Absolute Value Inequalities

4 Steps to Solving Absolute Value Inequalities .

1. Isolate the absolute value.
2. Identify the inequality sign  
Less than = "and"  
Greater than = "or"
3. Solve
4. Graph

Less Than *AND*

Greater *OR*

Solve & graph:

1.  $|x| < 3$

2.  $|2x + 4| < 6$

3.  $|3x + 1| < 8$

4.  $|x| > 3$

5.  $|2x - 4| \geq 6$

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6.  $|4x - 5| \geq 3$

7.  $\left|\frac{1}{2}x\right| + 1 < 5$

Always Isolate the Absolute  
Value before solving

8.  $-3|2x - 5| \geq -12$

9.  $12 - |3x + 2| \leq -13$