9-8 Warm-Up

Simplify.

1. $\sqrt{9x^2y^2}$

$$\sqrt{9}\,\sqrt{x^2}\,\sqrt{y^2}$$
$$3xy$$

2. $\sqrt{11x} \cdot \sqrt{11y}$

$$\sqrt{121xy}$$
$$\boxed{11\sqrt{xy}}$$

3. $\dfrac{6+\sqrt{28}}{2}$

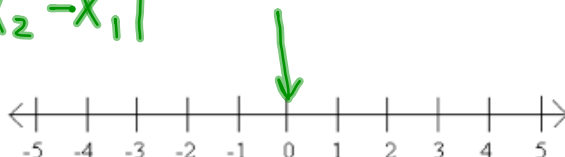$$\frac{6+\sqrt{4}\,\sqrt{7}}{2} = \frac{6+2\sqrt{7}}{2}$$
$$\frac{6}{2}+\frac{2\sqrt{7}}{2} = \boxed{3+\sqrt{7}}$$

Algebra 9-8 Absolute Value

Absolute value is the _distance_ from the _origin_. The _origin_ is zero.

IT IS _always_ _positive_ !!

Distance = $\left| X_2 - X_1 \right|$

Ex: $|-3| = \underline{3}$ $|3| = \underline{3}$

Ex) $X_2 = 5$
$X_1 = -3$

$$D = \left| 5 + 3 \right|$$
$$|8| = \boxed{8}$$

Graph y = | x |

Graphs of Absolute Values

x	y
-3	3
-2	2
-1	1
0	0
1	1
2	2
3	3

$|-3|$
$|-2|$
$|-1|$
$|0|$
$|1|$
$|2|$
$|3|$
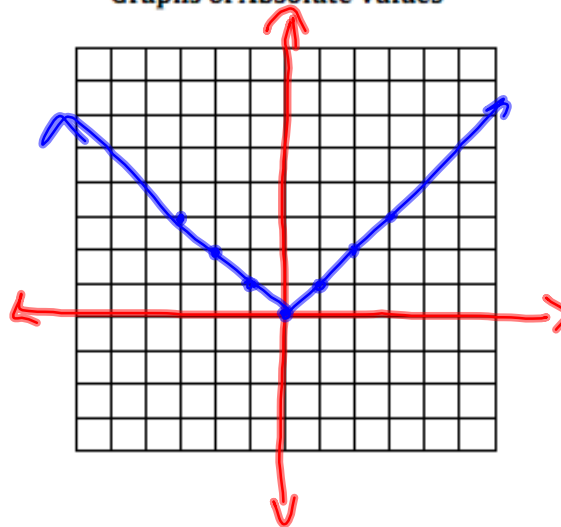
Notice it forms a V-Shape

Examples

Simplify numbers 1-4.

1. |6| 6

2. |-6| 6

3. $\left|\dfrac{1}{4}\right| = \dfrac{1}{4}$

4. $\left|\dfrac{-1}{4}\right| = \dfrac{1}{4}$

Evaluate 5 & 6.

5. |-2| – |8| 6. |-2 – 8|

2 – 8 |-10|

(-6)   (10)

Solve 7 – 9.

* When solving equations with absolute value, _write_ _out_ the _2_ equations. Set one equal to the _positive_ and the other _equal_ to the _negative_

7. $|x| = 18$

① $x = 18$ ✓

② $x = -18$ ✓

Check

8. $|d| = -4$

Needs to be positive

No Solution!

9. $|y + 4| = 16$

① $y + 4 = 16$
$\quad -4 \; -4$
$\boxed{y = 12}$ ✓

② $y + 4 = -16$
$\quad -4 \; -4$
$\boxed{y = -20}$ ✓

10. $|y - 7| = 3$

① $y - 7 = 3$
$\quad +7 \; +7$
$\boxed{y = 10}$ ✓

② $y - 7 = -3$
$\quad +7 \; +7$
$\boxed{y = 4}$ ✓

11. What is the distance between -15 and -25?

$$|-25 + ^+15| = |-10| = \boxed{10}$$

x_1 x_2

$$|x_2 - x_1|$$

12. What is the distance between 3 and 14?

$$||4-3| = |11| = \boxed{11}$$

x_1 x_2

13. What is the distance between x and 8?

$$|8 - x| \quad \text{or} \quad |x-8|$$

x_1 x_2

14. What is the distance between – x and -10?

$$|-10 - x| = |-10 + x|$$

x_1 x_2

9-8 #'s 2-8, 11-29, 31-34