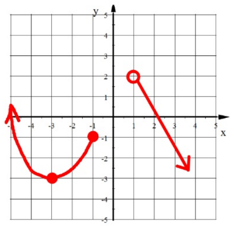
Interval Notation

Symbol used in an inquality:	≤ or ≥	< or >
Symbol used in interval notation:	[or]	(or)



	Inc:	Dec:
Inequalities:	$-3 \le x \le -1$	$x \le -3$ | $x > 1$
Interval Notation	$[-3, -1]$	$(-\infty, -3]$ | $(1, \infty$

Sec 1-5: Absolute Value Equations and Inequalities:

Absolute Value:

- Distance a number is from zero.
- Distance is a POSITIVE quantity.

Solve for x: $|x| = 7$

Definition Algebraic Definition of Absolute Value

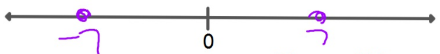
- If $x \ge 0$, then $|x| = x$.
- If $x < 0$, then $|x| = -x$.

$|x| = 7 \longrightarrow x = 7, x = -7$

$x = \pm 7$

$|x| = 7$

Distance from zero — Is exactly — 7 units



You could be 7 units to the left

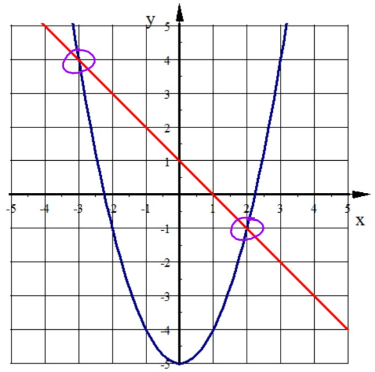
$x = -7$

You could be 7 units to the right

$x = 7$

One way to solve any equation is to use a graph.

How could you graph to solve this equation? $x^2 - 5 = -x + 1$



Graph the two sides as separate equations:

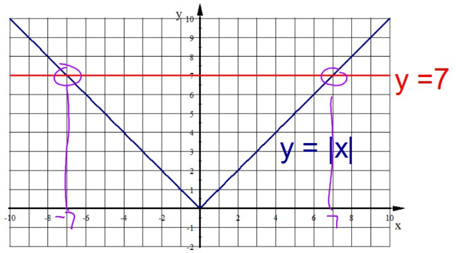
$y = x^2 - 5$ and $y = -x + 1$

The solutions are the x-coordinates of the points of intersection.

$x = -3, 2$

Solve: $|x| = 7$

$x = \pm 7$



These two graphs are equal where they intersect.

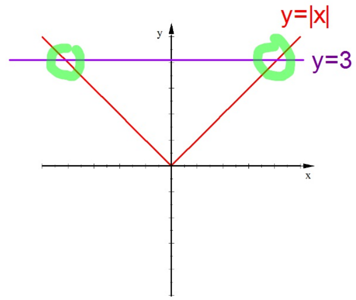
Since they interect where x = 7 and x = -7 these are the two solutions to the equation.

How many solutions could an Absolute Value Equation have?

2 solutions

$|x| = 3$

Two points of intersection

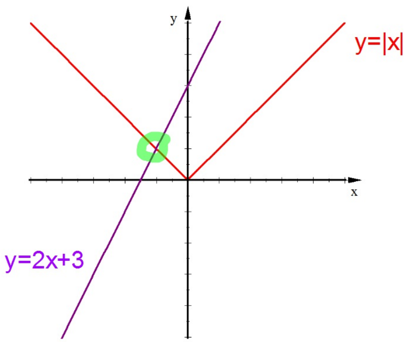


How many solutions could an Absolute Value Equation have?

1 solution

$|x| = 2x + 3$

Only one point of intersection

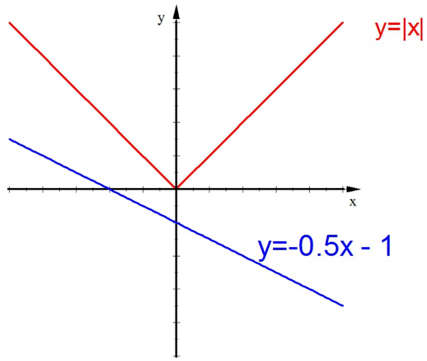


How many solutions could an Absolute Value Equation have?

No solution

$|x| = -0.5x - 1$

No point of intersection



Solve: $|2x - 6| = 13$

13 units

DISTANCE FROM zero

exactly

you could be 13 to the left of zero = -13

OR

you could be 13 to the right of zero = 13

$-13 \qquad 0 \qquad 13$

$$2x - 6 = -13$$
$$+6 \qquad +6$$
$$2x = -7$$
$$x = -3.5$$

$$2x - 6 = 13$$
$$+6 \qquad +6$$
$$2x = 19$$
$$x = 9.5$$

Solutions:

$x = -3.5, 9.5$