Algebra IA

Notes 4.7, Part 1 Absolute Value and Absolute Value Equations

absolute value – distance from zero on the number line
- always positive or zero

examples:

$\|3\| = 3$	$\|-7\| = 7$	$\|13\| = 13$	$\|0\| = 0$
$\|-3\| = 3$	$\|7\| = 7$	$\|-13\| = 13$	$\|-\frac{1}{2}\| = \frac{1}{2}$

Solve. $|x| = 7$

$x = 7$ or $x = -7$

$|x| = 13$

$x = 13$ or $x = -13$

$|x| = a$ (a is positive) There are 2 solutions.

$x = a$ or $x = -a$

$|x| = 0$ There is 1 solution.

$|x| = -2$ There are no solutions.

$|x + 1| = 8$

$x + 1 = 8$ or $x + 1 = -8$

$-1 \quad -1 \qquad -1 \quad -1$

$x + 0 = 7 \qquad x + 0 = -9$

$x = 7$ or $x = -9$

$|x - 2| = 6$

$x - 2 = 6$ or $x - 2 = -6$

$+2 \quad +2 \qquad +2 \quad +2$

$x + 0 = 8 \qquad x + 0 = -4$

$x = 8$ or $x = -4$

$|x + 3| = 10$

$x + 3 = 10$ or $x + 3 = -10$

$-3 \quad -3 \qquad -3 \quad -3$

$x + 0 = 7 \qquad x + 0 = -13$

$x = 7$ or $x = -13$

$|x - 4| = 12$

$x - 4 = 12$ or $x - 4 = -12$

$+4 \quad +4 \qquad +4 \quad +4$

$x + 0 = 16 \qquad x + 0 = -8$

$x = 16$ or $x = -8$