Algebra 2

Ch. 1 Handout 1.5

Absolute Value Equations and Inequalities

Algebraic Definition of Absolute Value

If $x \geq 0$, then $|x| =$ ___x___.

If $x < 0$, then $|x| =$ ___x___.

Absolute Value Inequalities: Let k represent a positive real numbe

$|x| \geq k$ is equivalent to $x \leq$ _____ or $x \geq$ _____

$|x| \leq k$ is equivalent to $-k \leq$ _____ $\leq k$

An extraneous solution is a solution of an equation derived from an original equation that is not a solution of the original equation.

Solving Multi-step Absolute Value Equations. Check for extraneous solutions.

1. $4 - 2|x+9| = -5$

$-4 \quad\quad -4$

$\frac{-2|x+9|}{-2} = \frac{-9}{-2}$

$|x+9| = \frac{9}{2}$

$-(x+9) = \frac{9}{2}$

$-x - 9 = \frac{9}{2} + 9$

$+9 \quad\quad +9$

$-x = \frac{9}{2} + \frac{18}{2}$

$-x = \frac{27}{2}$

$x = -\frac{27}{2} = -13.5$

$x + 9 = \frac{9}{2} - 9$

$-9 \quad\quad -9$

$x = \frac{9}{2} - \frac{18}{2}$

$x = \frac{-9}{2} = -4.5$

$x = -13.5, x = -4.5$

Solving Multi-step Absolute Value Equations. Check for extraneous solutions.

2. $|3x-4| = -4x-1$

$-(3x-4) = -4x-1$

$-3x+4 = -4x-1$

$+4x \quad -4 \quad +4x$

$x = -5$

$3x-4 = -4x-1$

$+4x \quad +4 \quad +4x+4$

$7x = 3$

$x = \frac{3}{7}$

3. $2|3x-1|+5=33$

$-5 \quad -5$

$\frac{2|3x-1|}{2}=\frac{28}{2}$

$|3x-1|=14$

$-(3x-1)=14$

$-3x+1=14$

$-1 \quad -1$

$-3x=13$

$3x-1=14$

$+1 \quad +1$

$\frac{3x}{3}=\frac{15}{3}$

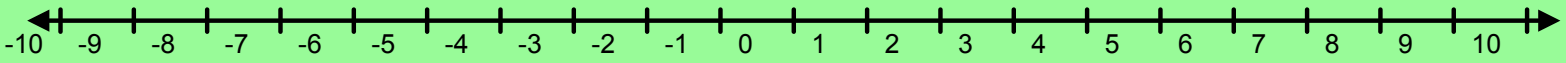
$x=\frac{-13}{3}$, $x=5$

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

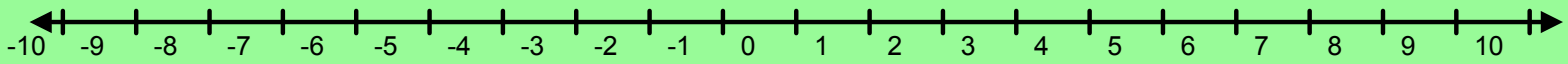
Solving Absolute Value Inequalities

Solve and Graph the solution.

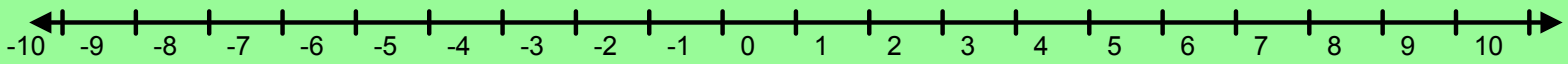
5. $|2x - 5| > 3$



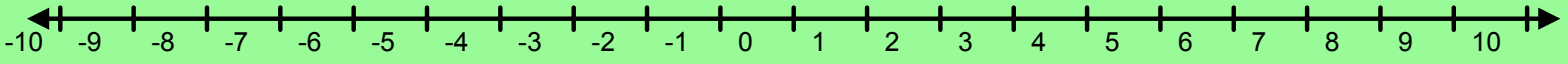
6. $-2|x+1|+5 \geq -3$



7. $|2x - 3| \geq 7$



8. $|5z+3|-7<34$



Assignments:

Day 1: 1.5 Pgs 36-38 2-14 evens, 34-42 evens