Inequalities containing Absolute Value

Algorithm

- 1. Isolate the absolute value
- 2. Set the expression and the opposite of the expression on the inside of the absolute value signs using the given inequality sign to the number on the outside
- 3. Solve the resulting two inequalities.
- 4. Abs V less than is "and"; Abs V greater then is an "or" statement

ExampleSolve |2x - 5| < 11If 2x - 5 is positive, thenANDIf 2x - 5 is negative, then2x - 5 < 11-(2x - 5) < 112x < 162x - 5 > -11x < 82x > -6x > -3

The solution is all the numbers between -3 and 8, $\{-3 < x < 8\}$

Solve and graph the following inequalities.

Hint, first determine, by inspection, if it is an "and" or "or" statement.

- 1. |x| < 7
- 2. $|x-1| \ge 8$
- 3. $|2x+1| \le 13$
- 4. |x-2|+4 < 10

- 5. $|2x-3| \ge 13$
- 6. |3(x-2)| > 12
- 7. 4 |3x 3| < 12
- 8. 2 | 2x 1 | + 1 > 15
- 9. |-4x| < 10
- 10. $|3x-1| \ge 5x+15$
- 11. |2x-6| < 0
- 12. $|5(2x+3)| \ge -10$