Absolute Value explanations

Ref: Carson Text pages 595 & 597

|x| < a where a > 0

- This is an *and*
- Write as: -a < x < a
- Solve the compound inequality
- Notation for solution:
 {x|-a < x < a}
 (-a, a)

 $|x| \le a$ where a > 0

- This is an *and*
- Write as: $-a \le x \le a$
- Solve the compound inequality
- Notation for solution:

 $\{x | -a \le x \le a\}$ [-a, a]

|x| > a where a > 0

- This is an or
- Write as: x < -a or x > a
- Solve the compound inequality
- Notation for solution: $\{x | x < -a \text{ or } x > a\}$ $(-\infty, -a) \text{ or } (a, +\infty)$

 $|x| \ge a$ where $a \ge 0$

- This is an *or*
- Write as: $x \le -a$ or $x \ge a$
- Solve the compound inequality
- Notation for solution: $\{x | x \le -a \text{ or } x \ge a\}$ $(-\infty, -a] \text{ or } [a, +\infty)$

What about < 0 ?

|x| < -a

No solution

 $|x| \leq -a$

• No solution

|x| > -a

- There is a solution; all values of x > 0 will be solutions
- Notation for solution:
 {x | x > a}
 (a, +∞)

 $|x| \ge -a$

- There is a solution; all values of $x \ge 0$ will be solutions
- Notation for solution: $\{x | x \ge a\}$ $[a, +\infty)$