Solving Inequalities

Idea: The primary difference between inequalities and equations can be found in the solutions to each type of problem. With equations one will arrive at a *finite* number of solutions. In other words, equations generally lead to a number of solutions that can be listed out. With inequalities the solutions are *infinite* and thus we must resort to **set building notation** to signify that there exist a multitude of correct answers.

Concept: The mechanics of solving inequalities is identical to solving equations. This chapter reviews those procedures and introduces a new rule that is unique to solving inequalities.

Rule: Anytime the inequality is either multiplied or divided by a negative value on both sides of the inequality then the direction of the inequality sign must be switched.

Examples of set building notation.

Ex1. $\{x \mid x \leq 5\}$

Ex2. $\left\{y \mid y > 3\frac{1}{4}\right\}$

Ex3. $\left\{w \mid w < -13\frac{1}{2}\right\}$

Ex4. $\left\{t \mid t \geq -13\frac{1}{2}\right\}$

* Set building notation necessitates that the variable is always listed on the left side of the statement.

*When equality is present then the circle will be shaded in. With a strict inequality, the circle will be left open.