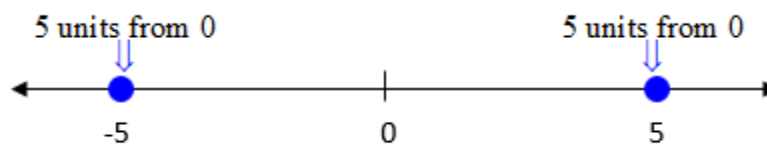# Section 1.8 Absolute Value Equations

Review of the Definition of Absolute Value and its Properties
See Section R.2, objective 4 in the etext for an in depth review.

Objective 1: Solving an Absolute Value Equation

The absolute value of a number x, written as $|x|$, represents the **distance** from a number x to 0 on the number line. Consider the equation $|x| = 5$. To solve for x, we must find all values of x that are 5 units away from 0 on the number line. The two numbers that are 5 units away from 0 on the number line are $x = -5$ and $x = 5$ as shown in the figure below. Therefore, the solution set for $|x| = 5$ is $\{-5, 5\}$.

In general, if u is an algebraic expression and c is a positive real number, then $|u| = c$ is equivalent to $u = c$ or $u = -c$.

When solving an absolute value equation or inequality, it is necessary to first isolate the absolute value expression.