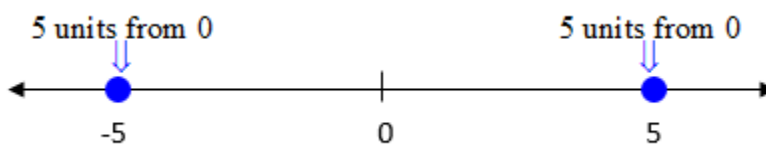


## Section 1.8 Absolute Value Equations

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

### 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  $u = -c$ .