Introduction to Disjunction and Conjunction

Consider the equation $|x| = 5$. To solve, you would graph both sides of the equation as functions ($y = |x|$ and $y = 5$) and mark the solution as the area where the graphs intersect.

The same method can be applied to inequalities. View the graphs and explanations on pages 1.4 through 1.7.

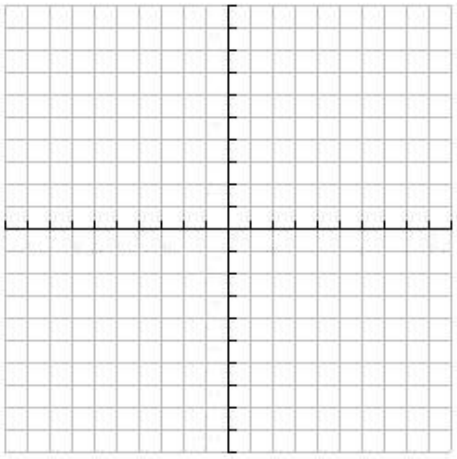
- When is an absolute value inequality a conjunction? A disjunction?

- On the graph, what do the dotted and solid horizontal lines tell you about whether the intersection points are included in the solution?

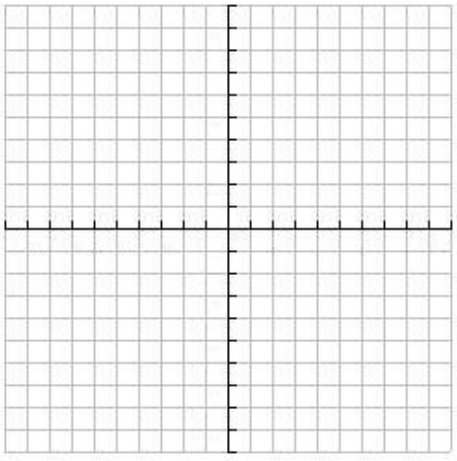
Application of Disjunction and Conjunction

On the pages 1.10–1.13, write the inequalities as either a conjunction or disjunction and then solve for *x*. Check your solution by graphing using the method described on page 1.3.

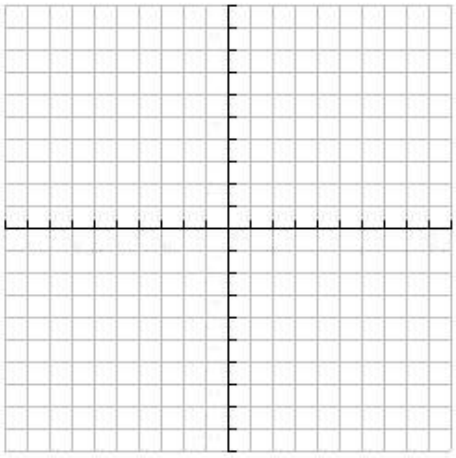
Problem 1: $|2x - 3| > 9$



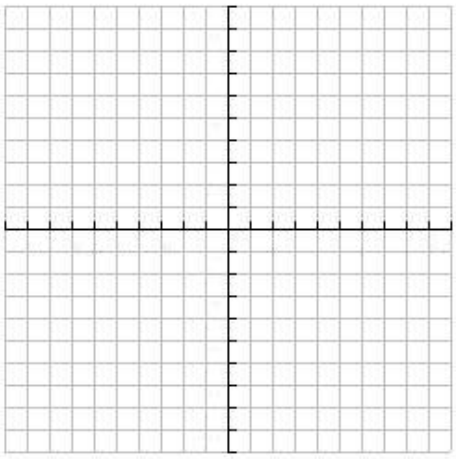
Problem 2: $\left|\frac{1}{3}x - 10\right| \leq 11$



Problem 3: $|3x|-1\geq 5$



Problem 4: $2|4x-7|+6<18$



Real World Application

One application of absolute value inequalities is engineering tolerance. Tolerance is the idea that an ideal measurement and an actual measurement can only differ within a certain range.

A bolt with a 10mm diameter has a tolerance range of 9.965mm to 10mm, while the hole that it fits into has a tolerance range of 10.05mm to 10.075mm.

How can you express the tolerances of both the bolt and the hole in terms of an absolute value inequality?