Section 1.9 Polynomial and Rational Inequalities

Objective 1: Solving Polynomial Inequalities

Steps for Solving Polynomial Inequalities	
Step 1:	**Move all terms to one side of the inequality leaving 0 on the other side.**
Step 2:	**Factor the nonzero side of the inequality.**
Step 3:	**Find all boundary points by setting the factored polynomial equal to zero.**
Step 4:	**Plot the boundary points on a number line. If the inequality is $\leq$ or $\geq$, use a solid circle ●. If the inequality is < or >, use an open circle ○.**
Step 5:	**Now that the number line is divided into intervals, pick a test value from each interval.**
Step 6:	**Substitute the test value into the polynomial and determine whether the expression is positive or negative on the interval.**
Step 7:	**Determine the intervals that satisfy the inequality.**

1.9.6
Solve the inequality. Write the solution in interval notation.

The solution is _____.

1.9.10
Solve the inequality. Write the solution in interval notation.

The solution is _____.

Section 1.9b Rational Inequalities

Objective 2: Solving Rational Inequalities

A rational inequality can be solved using a technique similar to the one used to solve a polynomial inequality except that the boundary points are found by setting both the polynomial in the numerator and the denominator equal to zero.

Since division by zero is **never** permitted, the boundary points that are found by setting the polynomial in the denominator equal to zero must always be represented by an **open circle** on the number line.

You cannot multiply both sides of the inequality by a variable term to clear the fraction. It is necessary to move all terms to one side, combine terms over a common denominator, and proceed as above.

1.9. 14
Solve the inequality. Express the answer using interval notation.

1.9.16
Solve the inequality. Express the solution using interval notation.

1.9.18
Solve the inequality. Express the solution using interval notation