
MATH 11009: Polynomial and Rational Inequalities Section 6.6

- **Solving Polynomial and Rational Inequalities:**

1. Write an equivalent inequality with zero on one side and with the function $f(x)$ on the other side.
2. Solve $f(x) = 0$. (For rational inequalities, also determine where the denominator is zero.)
3. Create a sign chart that uses the solutions of Step 2 to divide the number line into intervals.
4. In each interval, use a test value to determine the sign (positive or negative) of the product or quotient in that interval.
5. Identify the intervals that satisfy the inequality in Step 1. The values of x that define these intervals are the solutions to the original inequality. Be sure to check whether the inequality is satisfied at some or all of the endpoints.

Example 1. Solve for x :

$$3x^2 + 7x - 6 \geq 0$$

Example 2. Solve for x :

$$x^3 < x^2$$

Example 3. Solve for x :

$$\frac{2-x}{x+1} \leq 0$$

Example 4. Solve for x :

$$\frac{3x - 11}{6x^2 + 11x - 10} \geq 0$$

Example 5. Solve for x :

$$\frac{1}{x - 2} > \frac{2}{x}$$

Example 6. The price for a product is given by $p = 1000 - 0.1x^2$, where x is the number of units sold. Selling how many units gives positive revenue?