

Section 2.7 Nonlinear Inequalities

Objective: In this lesson you learned how to solve polynomial inequalities and rational inequalities.

Course Number

Instructor

Date

Important Vocabulary

Define each term or concept.

Critical numbers**I. Polynomial Inequalities** (Pages 197–200)

Where can polynomials change signs?

What you should learn
How to solve polynomial inequalities

Between two consecutive zeros, a polynomial must be . . .

When the real zeros of a polynomial are put in order, they divide the real number line into . . .

These zeros are the _____ of the inequality, and the resulting intervals are the _____ for the inequality.

Complete the following steps for determining the intervals on which the values of a polynomial are entirely negative or entirely positive:

1)

2)

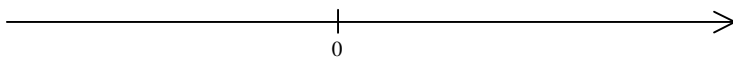
3)

To check the solution of the polynomial inequality

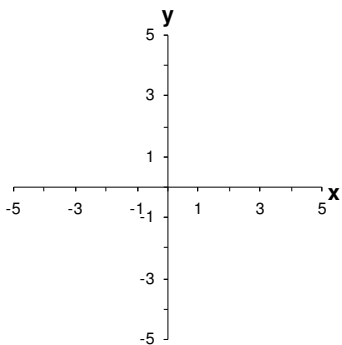
$$3x^2 + 2x - 5 < 0 \text{ with a graph, . . .}$$

If a polynomial inequality is not given in general form, you should begin the solution process by . . .

Example 1: Solve $x^2 + x - 20 \geq 0$ and graph the solution set.



Example 2: Use a graph to solve the polynomial inequality $-x^2 - 6x - 9 > 0$.



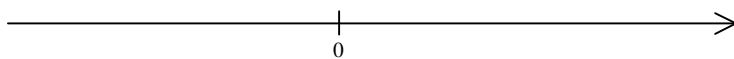
II. Rational Inequalities (Page 201)

To extend the concepts of critical numbers and test intervals to rational inequalities, use the fact that the value of a rational expression can change sign only at its _____ and its _____. These two types of numbers make up the _____ of a rational inequality.

What you should learn
How to solve rational inequalities

To solve a rational inequality, . . .

Example 3: Solve $\frac{3x+15}{x-2} \leq 0$ and graph the solution set.



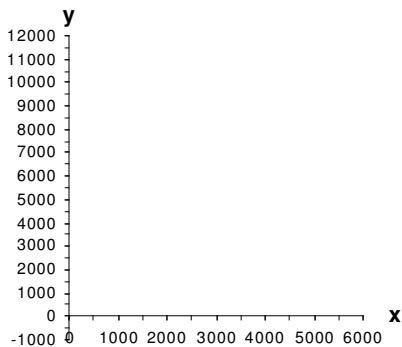
III. Applications of Other Inequalities (Pages 202–203)

A formula that relates profit, revenue, and cost is

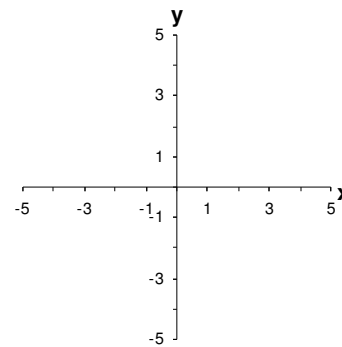
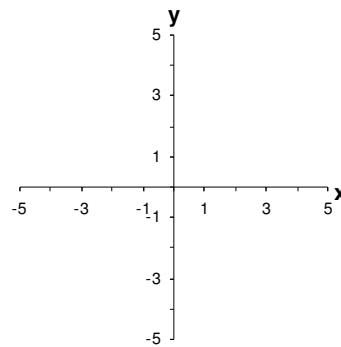
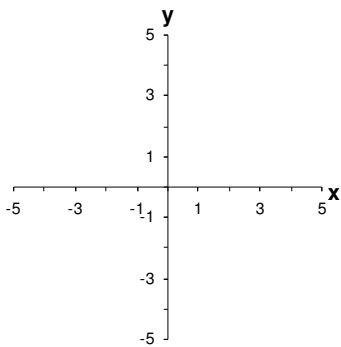
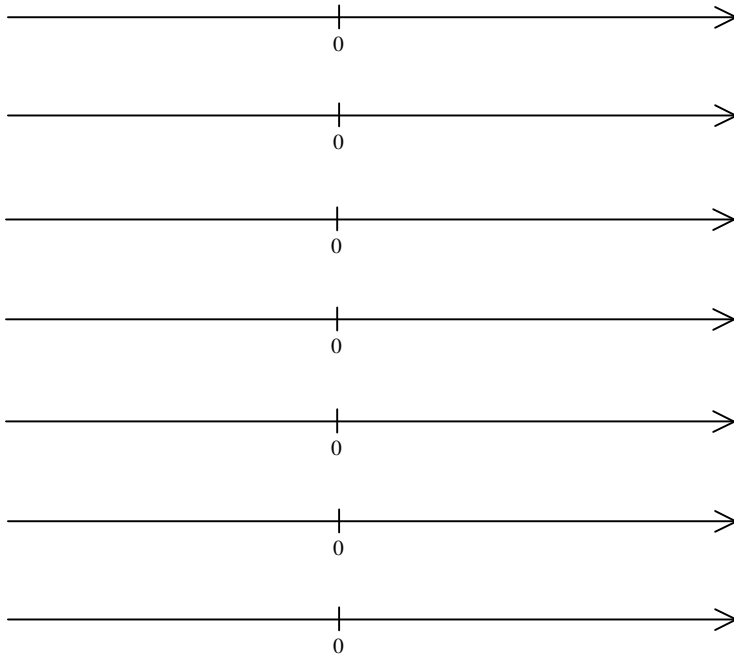
_____.

What you should learn
 How to use inequalities to model and solve real-life problems

Example 4: Let the revenue for a product be given by $R = x(30 - 0.005x)$ and the cost for the same product be given by $C = 5x + 20,000$, where R and C are measured in dollars and x represents the number of units sold. How many units must be sold to obtain a positive profit?



Additional notes



Homework Assignment

Page(s)

Exercises