

**Section 1.8 Other Types of 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 153–156)

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 \_\_\_\_\_.

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

1)

2)

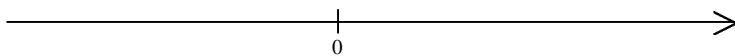
3)

To check the solution of the polynomial inequality

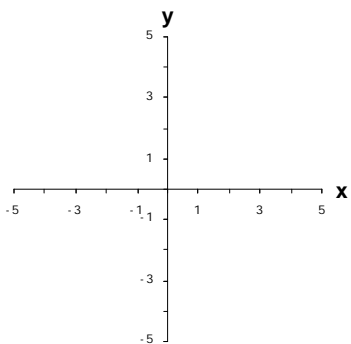
$$3x^2 + 2x - 5 < 0 \text{ with a graph, . . .}$$

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  $-x^2 - 6x - 9 > 0$ .



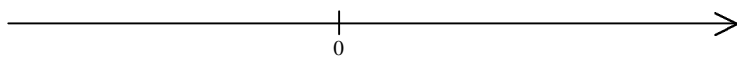
## II. Rational Inequalities (Page 157)

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.



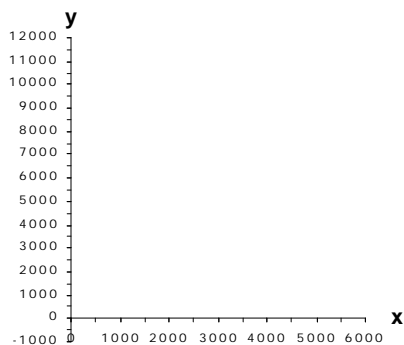
### III. Applications of Other Inequalities (Pages 158–159)

A formula that relates profit, revenue, and cost is

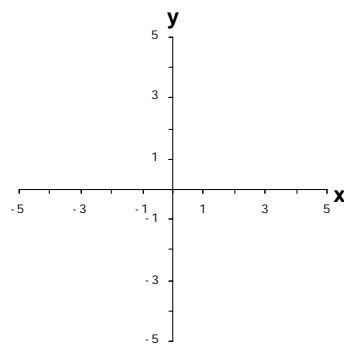
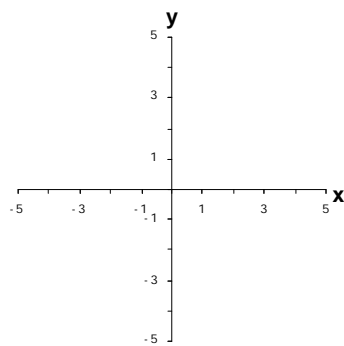
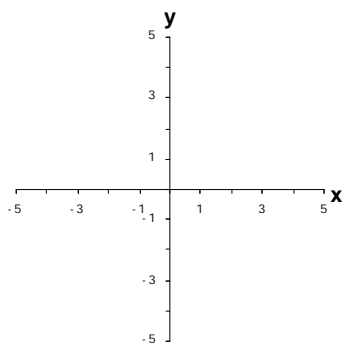
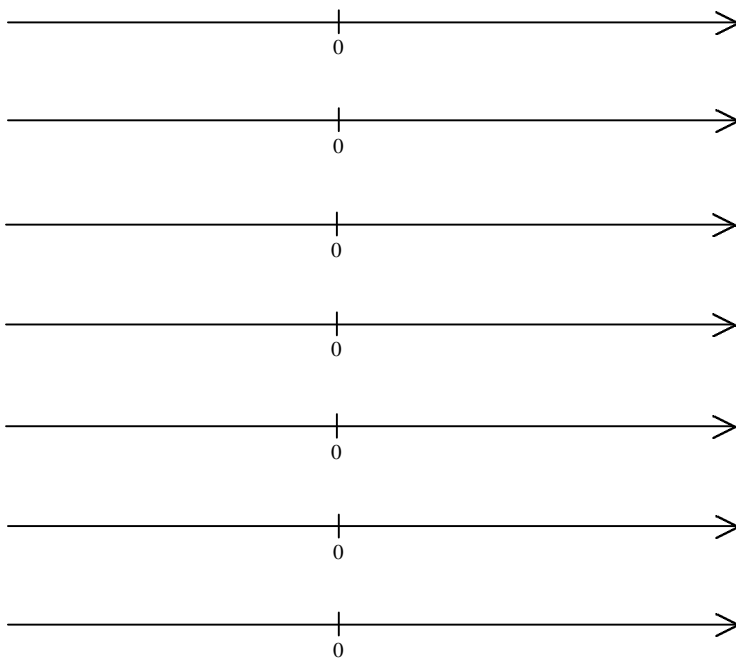
\_\_\_\_\_.

***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**



<p><b>Homework Assignment</b></p> <p>Page(s)</p> <p>Exercises</p>
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