

Section P.6 Solving Inequalities

Objective: In this lesson you learned how to solve linear, polynomial, rational, and absolute value inequalities.

Course Number

Instructor

Date

Important Vocabulary

Define each term or concept.

Linear inequality**Critical numbers****I. Introduction to Inequalities** (Page 62)Solving an inequality in the variable x means . . .

What you should learn
How to use the language of inequalities

The graph of an inequality is . . .

II. Properties of Inequalities (Page 63)

To solve a linear inequality, use the _____
_____ to isolate the variable.

What you should learn
How to recognize solutions of linear inequalities

When each side of an inequality is multiplied or divided by a negative number, . . .

Two inequalities that have the same solution set are _____.

Complete the list of Properties of Inequalities given below.

- 1) Transitive Property: $a < b$ and $b < c \rightarrow$ _____
- 2) Addition of Inequalities: $a < b$ and $c < d \rightarrow$ _____
- 3) Addition of a Constant c : $a < b \rightarrow$ _____
- 4) Multiplication by a Constant c :
 - For $c > 0$, $a < b \rightarrow$ _____
 - For $c < 0$, $a < b \rightarrow$ _____

III. Linear Inequalities (Pages 64–65)

Describe the steps that would be necessary to solve the linear inequality $7x - 2 < 9x + 8$.

What you should learn

How to use properties of inequalities to solve linear inequalities

The two inequalities $-10 < 3x$ and $14 \geq 3x$ can be rewritten as the double inequality _____.

IV. Absolute Value Inequalities (Page 66)

Let x be a variable or an algebraic expression and let a be a real number such that $a \geq 0$. The solutions of $|x| < a$ are all values of x that _____. The solutions of $|x| > a$ are all values of x that _____.

What you should learn

How to solve inequalities involving absolute values

Example 1: Solve the inequality: $|x + 11| - 4 \leq 0$

The symbol \cup is called a _____ symbol and is used to denote _____.

Example 2: Write the following solution set using interval notation: $x > 8$ or $x < 2$

V. Other Types of Inequalities (Pages 67–69)

Where can a polynomial change signs?

What you should learn

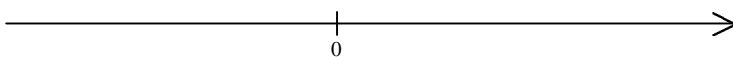
How to solve polynomial and rational inequalities

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 _____.

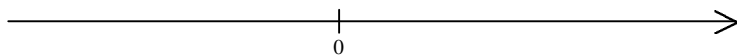
Example 3: Solve $x^2 + x - 20 \geq 0$ and graph the solution set.

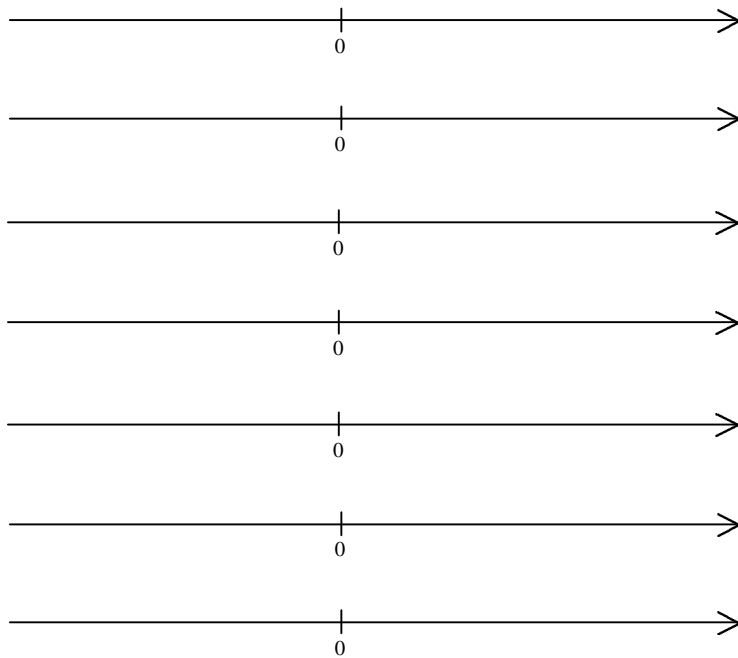


To extend the concepts of critical numbers and test intervals to rational inequalities, use the fact that the value of a rational expression can change sign only at its _____ and its _____. These two types of numbers make up the _____ of a rational inequality.

To solve a rational inequality, . . .

Example 4: Solve $\frac{3x+15}{x-2} \leq 0$ and graph the solution set.



Additional notes**Homework Assignment**

Page(s)

Exercises