Course Number

Instructor

Date

Section P.5 Solving Inequalities Algebraically and Graphically

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

Important Vocabulary	Define each term or concept.
Solutions of an inequality	
Graph of an inequality	
Linear inequality	
Double inequality	
Critical numbers	
Test intervals	

I. Properties of Inequalities (Pages 54–55)

What you should learn
How to recognize properties of inequalities

Solving an inequality in the variable x means . . .

Numbers that are solutions of an inequality are said to _____ the inequality.

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

When both sides of an inequality are 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 $c < 0$, $a < b \rightarrow$ _____

II. Solving a Linear Inequality (Pages 55–56)

What you should learn
How to use properties of inequalities to solve linear inequalities

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

To use a graphing utility to solve the linear inequality $7x - 2 < 9x + 8$, . . .

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

III. Inequalities Involving Absolute Value (Page 57)

What you should learn
How to solve inequalities involving absolute values

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 _____ _____.

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 $x < 2$

IV. Polynomial Inequalities (Pages 58–60)

What you should learn
How to solve polynomial inequalities

Where can polynomials change signs?

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 open intervals are the _____.

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

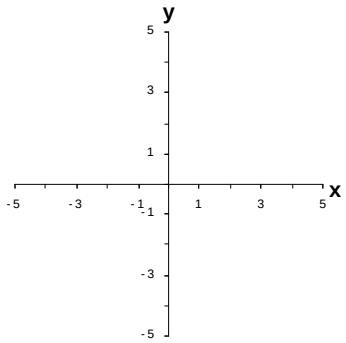
1)

2)

3)

To approximate the solution of the polynomial inequality $3x^2 + 2x - 5 < 0$ from a graph, . . .

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



Example 3: Solve $x^2 + x - 20 \geq 0$.

Example 4: Use a graph to solve the polynomial inequality $-x^2 - 6x - 9 > 0$.

V. Rational Inequalities (Page 61)

What you should learn
How to solve rational inequalities

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 5: Solve $\frac{3x+15}{x-2} \leq 0$.

Homework Assignment

Page(s)

Exercises