

Solving Inequalities Graphically

ID: 9989

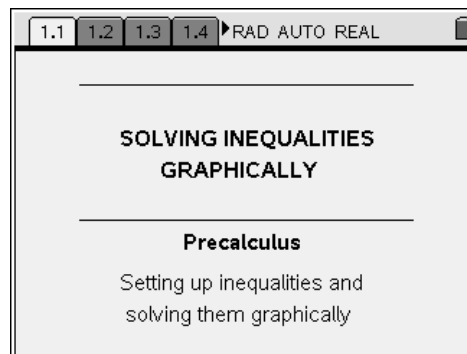
Name _____

Class _____

In this activity, you will explore:

- *Setting up and solving inequalities graphically.*

Open the file *PreCalcAct06_SolvInequGraph_EN.tns* on your handheld and follow along with your teacher to work through the activity. Use this document as a reference and to record your answers.

**Problem 1 – A Pizza Party**

The members of the Math Club are organizing a pizza party. They can spend up to \$30.00 on the pizza. Each large pizza costs \$4.00, and there is a delivery charge of \$3.50. How many pizzas can they afford?

- Would you use an equation or an inequality for this situation? Explain.

On the graph on page 1.4, drag the points on the x-axis to move points *A* and *B* to show the minimum and maximum number of pizzas that they can afford, respectively. Then verify your solution using the table on page 1.5.

- Record the number of pizzas the Math Club can afford as an inequality, in interval notation, and in words.

The members of the Math Club didn't spend as much money on drinks and snacks as they had planned, so they now have an additional \$15 to spend on the pizza.

- How does this affect the number of pizzas they can afford? Set up the inequality and solve as before, using the graph or the table.

Problem 2 – The Path of a Rocket

A rocket is launched from the ground and its height, in feet, is given by the equation $f_1(x) = 128x - 16x^2$, where x is the time in seconds. Use the graph on page 2.2 to answer the following two questions.

- The people who launched the rocket could not see when it was more than 150 feet from the ground. For what time period could they not see the rocket?

- For what time period was the rocket less than 75 feet from the ground?

Problem 3 – A Snowstorm

The function $f_1(x)$ that is graphed on page 3.2 represents the depth of accumulated snow, in feet, over one week during a snowstorm, where x represents time in days from the beginning of the storm. For each of the following questions, set up an inequality and use the graph to solve.

- A spectacular snowman can only be built when there is at least 1.5 feet of snow on the ground. Over what time period could a snowman have been built?

- It is highly recommended to *not* drive on the roads when there is more than 0.75 foot of snow on the ground. During what time periods during this week was it *safe* to drive on the roads?

Problem 4 – Lung Capacity

The average resting human respiratory cycle (inhaling and exhaling) is five seconds in length. During those five seconds, the volume of air, in liters, in a person's lungs can be approximated by the function $f_1(x) = 0.044x^3 - 0.33x^2 + 0.57x + 2.41$, where x represents the time in seconds.

- For how many seconds in the average respiratory cycle are there more than 2.5 liters of air in the lungs?