

Testing for Truth

ID: 12176

Time required
15–20 minutes

Activity Overview

In this activity, students will identify whether points lie within a shaded region that is bounded by linear inequalities. The focus is on testing the points for truth in the inequality. Students will use a graph to verify their answers.

Topic: Inequalities

- *Students will visually determine the location of a point with regard to shading or the line itself. (Above, below, or on the line itself)*
- *Students will answer True or False as to whether a point satisfies multiple conditions established by linear inequalities.*

Teacher Preparation and Notes

- *Students will utilize a random number generator (hidden) to create unique scenarios and answer questions about the points plotted as a result.*
- *Students will organize their thinking by using a table structure on the worksheet to answer True or False as to whether a point lies within a shaded region.*
- ***To download the student TI-Nspire document (.tns file) and student worksheet, go to <http://education.ti.com/exchange> and enter “12176” in the quick search box.***

Associated Materials

- *TestingForTruth_Student.doc*
- *TestingForTruth.tns*

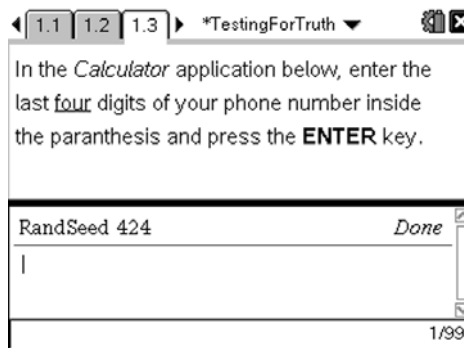
Suggested Related Activities

To download any activity listed, go to education.ti.com/exchange and enter the number in the quick search box.

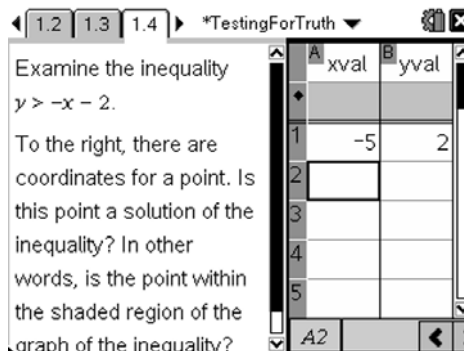
- *Linear Inequalities (TI-Nspire technology) — 8770*
- *Linear Inequalities (TI-84 Plus) — 8773*
- *Linear Inequalities (TI-84 Plus and TI-Navigator) — 8333*

Problem 1

Students begin this activity by setting the random seed, so that students will not get the same sets of points throughout the activity. Instructions are given to use the last 4 digits of their phone numbers, but other numbers could be used, such as house or apartment number or birthday (in the form MMDD).



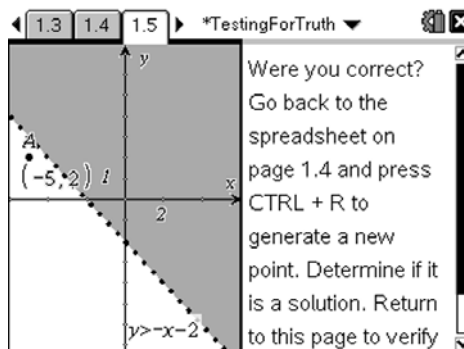
On page 1.4, students should press **(ctrl) + (R)** to generate new coordinates. The generator will only create points within a certain range so that the points are within the visible window. To generate the new coordinates, students MUST have the spreadsheet active. Students cannot have a flashing cursor in a cell. If an error appears on the screen, then students are active within a cell. They can press **(esc)** to get rid of the flashing cursor and press **(ctrl) + (R)** again to generate the new coordinates.



The table on the student worksheet will make it easier for students to organize their thinking and to show their work.

Students verify their answers on page 1.5.

What will students write if the point lands on the line itself? On the line is not included in the shaded region for this example, since the inequality is $y > -x - 2$.



Problem 2

The emphasis here can be on dotted and solid lines, $<$, \leq , $>$, \geq symbols.

Again, to generate new points, be sure that students are on have the cursor (not blinking) resting in one of the spreadsheet cells such as A1, before pressing $\text{ctrl} + \text{R}$.

Students use page 2.2 to verify their results.

If the students can't clearly determine whether the point lands on a line, or within or outside of the shaded region, don't use that point for simplicity of discussion.

Examine the inequalities $y \leq 4$ and $y > -2$.

To the right, there are 3 sets of coordinates. Are any of these points solutions of the inequality? Check your hypotheses on the next page.

	A	xval	B	yval
1		5		-7
2		7		2
3		-5		-1
4				
5				

Were you correct? Go back to the spreadsheet on page 2.1 and generate new points. Determine if any of those are solutions. Return to this page to verify your

Problem 3

On page 3.2, students must regenerate points until at least one lies within the triangle on page 3.3.

Encourage the students to continue regenerating ordered pairs as outlined earlier if they cannot easily see the grid in order to record the correct numbers.

Students will verify their results on page 3.3.

If the students can't clearly determine whether the point lands on a line, or within or outside of the shaded region, don't use that point for simplicity of discussion.

Verify your answers using the graph on the next page.

$y \leq 0.25x + 4$
 $y \geq -2x - 1$
 $y \geq x + 2$

	A	xval	B	yval	C
1		9		6	
2		-6		-4	
3		6		-2	
4					
5					

If needed, generate new points on page 3.2 to try again.