

Activity overview

This activity is designed to introduce students to the concept of inequalities. Students will discover how to graph inequalities on a number line.

Concepts

- ✓ Inequalities
 - ✓ Equations
 - ✓ Number lines
-

Teacher preparation

This activity is designed to introduce students to the concept of inequalities. The file *inequalities.tns* should be pre-loaded on the handheld.

Classroom management tips


Students can navigate through the student file independently or in small groups and answer the questions in the document.

TI-Nspire Applications

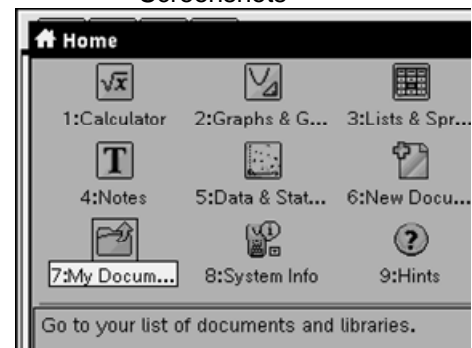
- ✓ Calculator
 - ✓ Question
 - ✓ Graphs and Geometry
-

Step-by-step directions

Steps:

1. From the home screen, choose My Documents and navigate to the appropriate folder containing the .tns file *inequalities*. Highlight the file and press . Choose whether or not to save changes to any previous document.

Screenshots



Inequalities

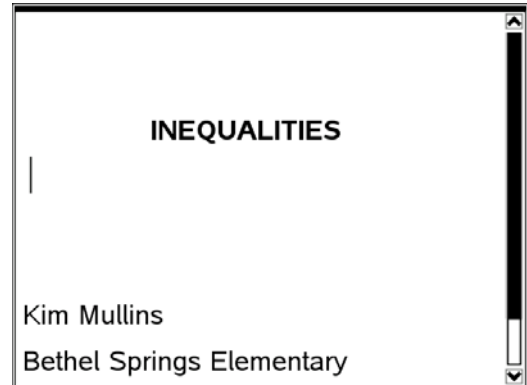
by: Kim Mullins

Grade level: 5-8

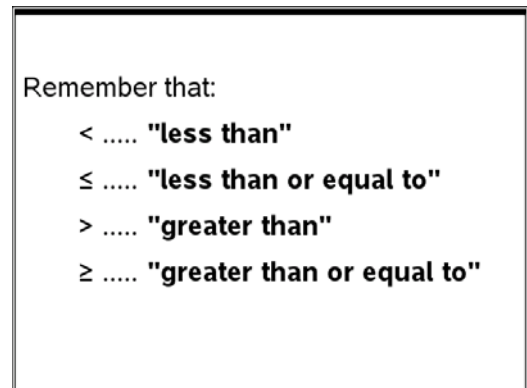
Subject: mathematics

Time required: 90

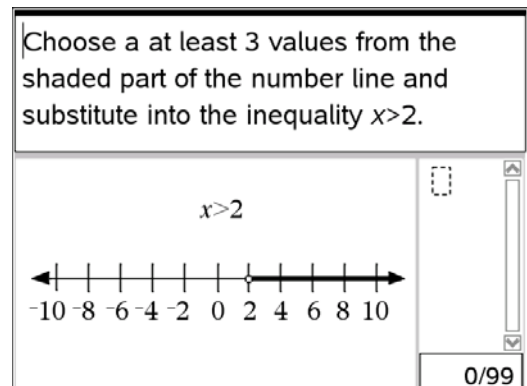
2. Page 1.1 is the title page for the activity. Press $\text{ctrl} \rightarrow$ and $\text{ctrl} \leftarrow$ to navigate through the document. Pressing $\text{ctrl} \uparrow$ will give you a thumbnail view of all pages in the document.



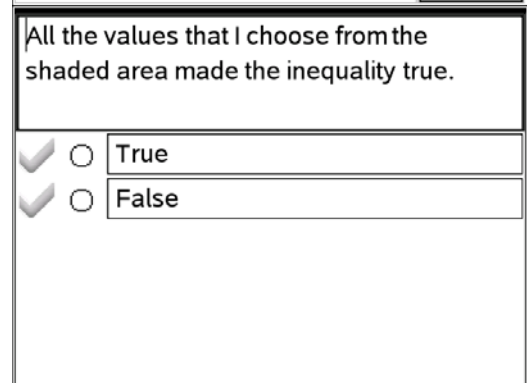
3. Remember these helpful hints.



4. Choose values that make the inequality true. You may need to press $\text{ctrl} \text{ tab}$ to get to the calculator.



5. Choose the correct answer. You may need to press $\text{ctrl} \text{ tab}$ to get to the answer.



Inequalities

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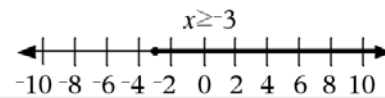
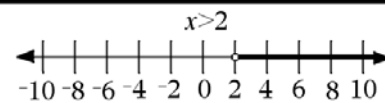
6. Helpful info.

These three values **satisfy** the inequality $x > 2$ because they result in *true* statements when you substitute the appropriate values.

All x -values in the shaded part of the number line satisfy the inequality $x > 2$ and are therefore members of the solution set.

7. Analyze the graphs.

Now compare the graph of the inequality $x > 2$ to that of $x \geq -3$. How are the graphs and inequalities similar? How are they different?



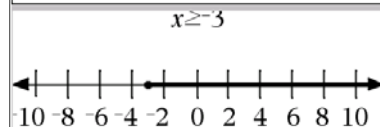
8. Remember this helpful tip.

On the next page, you will need to enter the "greater than or equal to" sign in the *Calculator* application.

To do so, you can type ">" followed by "=" or simply press **CTRL+[greater than]**.

9. Choose values that make the inequality true and or false. You may need to press **ctrl tab** to get to the calculator.

Predict whether x -values from the *shaded* part of the graph will result in a *true* or *false* statement. Test your prediction by substituting three values.



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10. Choose values that make the inequality true and or false. You may need to press **ctrl** **tab** to get to the calculator.

Predict whether x -values from the *unshaded* part of the graph will result in a *true* or *false* statement. Test your prediction by substituting three values.

$x \geq -3$

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11. Choose values that make the inequality true and or false. You may need to press **ctrl** **tab** to get to the calculator.

Predict whether the x -value located at the closed circle will result in a *true* or *false* statement. Once more, test your prediction by substituting -3 into $x \geq -3$.

$x \geq -3$

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12. Read Carefully.

The value -3 satisfies the inequality because it results in a *true* statement when you substitute it into the inequality.

Since -3 is included in the solution set, this inequality is **inclusive**.

13. Drag the words to the correct boxes. You may need to press **ctrl** **tab** to get to the words. Place the **↔** cursor over the word. When you see a hand **☞**, press the **Ⓚ**. The hand should close **☞** on the word and you can use the **⬅****➡** to move the word where needed.

Drag the words *true* and *false* into the appropriate boxes representing the three parts of the graph.

$x \geq -3$

true
true
false

↓ *closed circle*

-10 -8 -6 -4 -2 0 2 4 6 8 10

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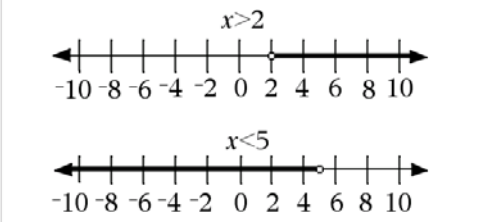
14. Analyze the graphs.

15. Choose values that make the inequality true and or false. You may need to press **ctrl** **tab** to get to the calculator.

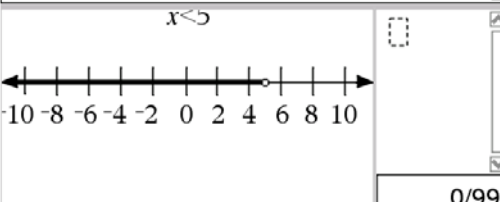
16. Choose values that make the inequality true and or false. You may need to press **ctrl** **tab** to get to the calculator.

17. Choose values that make the inequality true and or false. You may need to press **ctrl** **tab** to get to the calculator.

Now compare the graph of the inequality $x > 2$ to that of $x < 5$. How are the graphs and inequalities similar?

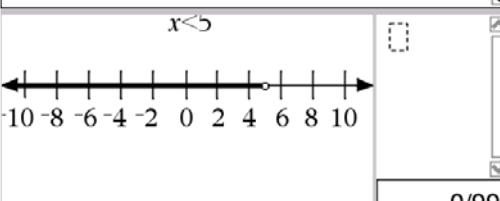


Predict whether x -values from the *shaded* part of the graph will result in a *true* or *false* statement. Test your prediction by substituting three values.



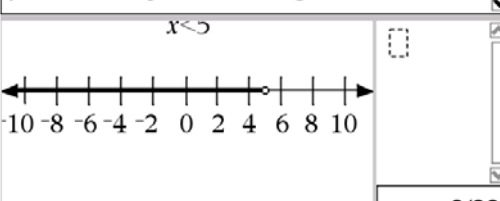
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Predict whether x -values from the *unshaded* part of the graph will result in a *true* or *false* statement. Test your prediction by substituting three values.



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Predict whether the x -value located at the open circle will result in a *true* or *false* statement. Once more, test your prediction by substituting 5 into $x < 5$.



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18. Drag the words to the correct boxes. You may need to press **ctrl** **tab** to get to the words. Place the **↔** cursor over the word. When you see a hand **☞**, press the **☺**. The hand should close **☞** on the word and you can use the **⬅****➡** to move the word where needed.

Drag the words *true* and *false* into the appropriate boxes representing the three parts of the graph. Is this inequality inclusive or noninclusive?

true
false
false

$x < 5$
open circle ↓

-10 -8 -6 -4 -2 0 2 4 6 8 10

19. Analyze the graphs.

Now compare the graph of the inequality $x < 5$ to that of $x \leq -1$. How are the graphs and inequalities similar?

$x < 5$

$x \leq -1$

20. Choose values that make the inequality true or false. You may need to press **ctrl** **tab** to get to the calculator.

Predict whether x -values from the *shaded* part of the graph will result in a *true* or *false* statement. Test your prediction by substituting three values.

$x \leq -1$

-10 -8 -6 -4 -2 0 2 4 6 8 10

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21. Choose values that make the inequality true or false. You may need to press **ctrl** **tab** to get to the calculator.

Predict whether x -values from the *unshaded* part of the graph will result in a *true* or *false* statement. Test your prediction by substituting three values.

$x \leq -1$

-10 -8 -6 -4 -2 0 2 4 6 8 10

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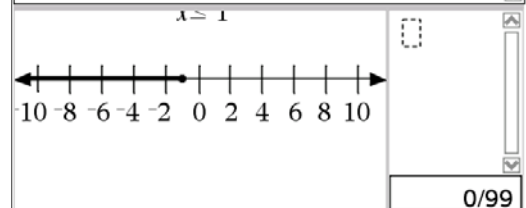
22. Choose values that make the inequality true and or false. You may need to press **ctrl** **tab** to get to the calculator.

23. Drag the words to the correct boxes. You may need to press **ctrl** **tab** to get to the words. Place the **↔** cursor over the word. When you see a hand **☞**, press the **☹**. The hand should close **☞** on the word and you can use the **⬅****➡** to move the word where needed.

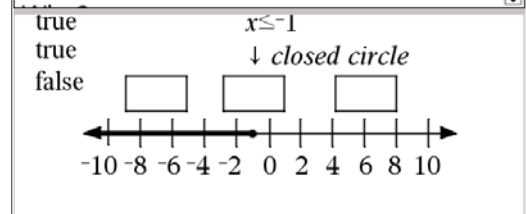
24. Good information.

25. Helpful Hints.

Predict whether the x -value located at the closed circle will result in a *true* or *false* statement. Once more, test your prediction by substituting -1 into $x \leq -1$.



Drag the words *true* and *false* into the appropriate boxes representing the three parts of the graph. Is this inequality inclusive or noninclusive?



Now you will apply what you have learned by graphing four inequalities.

- First, determine whether the shaded part will be on the left or right side of the number line.
- Then grab one of the open circles near the left or right end of the number line and drag it to the appropriate position.

▪ If the inequality is inclusive, you will need to change the open circle to a closed circle. To do so, hover the cursor over the open circle until it begins to flash, and press **CTRL+MENU**. Select **Attributes**, press left on the NavPad, and press **ENTER**.

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26. Determine whether the shaded part will be on the left or right side of the number line. Grab one of the open circles near the left or right end of the number line and drag it to the appropriate position.

If the inequality is inclusive, you will need to change the open circle to a closed circle. To do so, hover the \uparrow cursor over the open circle until it begins to flash, and press

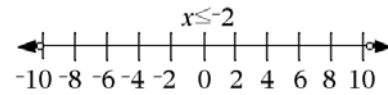
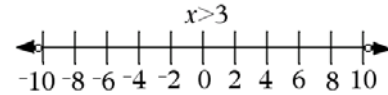
ctrl menu . Select Attributes, press \leftarrow enter clear

27. Determine whether the shaded part will be on the left or right side of the number line. Grab one of the open circles near the left or right end of the number line and drag it to the appropriate position.

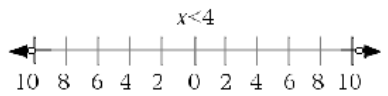
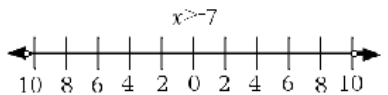
If the inequality is inclusive, you will need to change the open circle to a closed circle. To do so, hover the \uparrow cursor over the open circle until it begins to flash, and press

ctrl menu . Select Attributes, press \leftarrow enter clear

Graph each inequality.



Graph each inequality.



Student TI-Nspire Document
inequalities.tns.