Solving Polynomial Inequalities

Name: _____

Date:_____

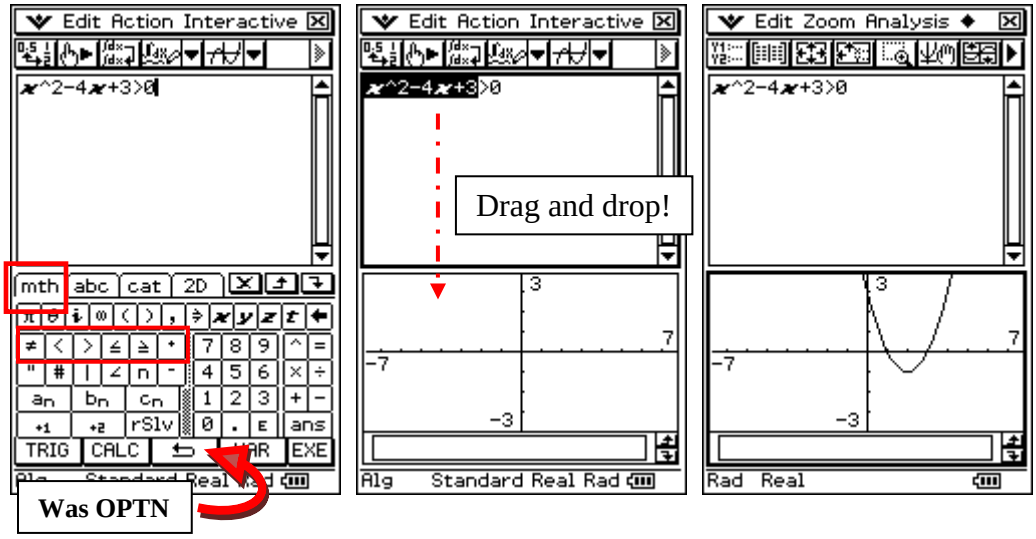
Finding Solutions to Polynomial Inequalities Graphically

Example 1 Solve $x^2-4x+3>0$

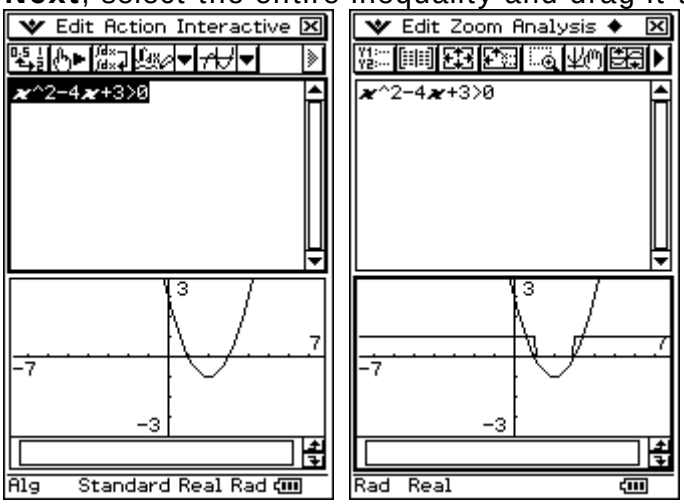
To solve graphically, you will need to do the following:

a) Open Main and select **Edit/Clear All** if needed
b) Make sure you are in **REAL** mode, not Cplx
c) Press the k button to open the soft keyboard
d) Tap the 9 tab and the lower K button to find the inequality symbols
e) Input the inequality shown
f) Tap the $ button to insert the Graph window
g) **Select** just the polynomial, **not** the inequality part
h) Press on selection and drag to the Graph window

- Consider the solution. What part of the graph is above 0?
- Solution estimate from graph: {x| x<1 or x>3}, or (-∞,1), (3, ∞)

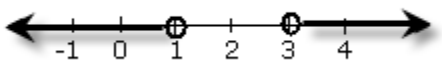


Next, select the entire inequality and drag it to the graph window:



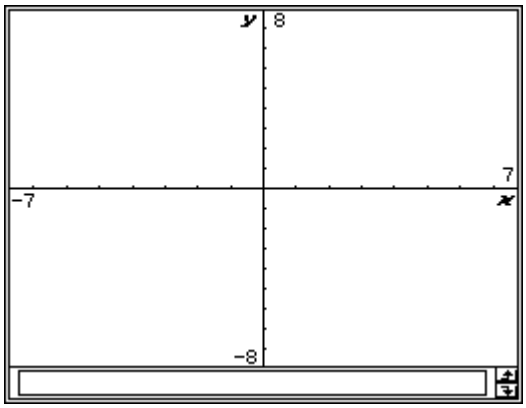
We can see the solution better! The ClassPad graphs y=1 when true and y=0 when false, but is not good with end-points.

Consider the solution on a number line:



Using steps similar to Example 1, complete the following exercises:

Exercise 1: Solve $(x-2)(x+3)>0$



a) First graph just $(x-2)(x+3)$ and sketch the graph.

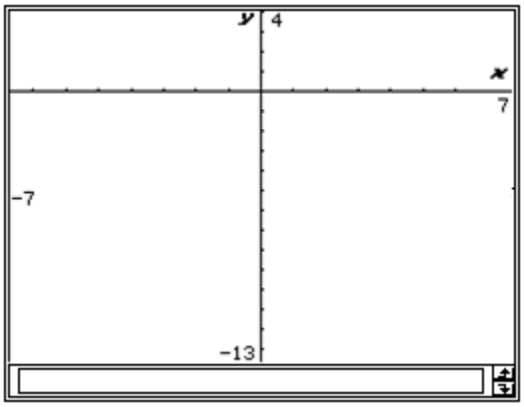
b) Write your estimated solution using set builder notation or interval notation:

_____

c) Next, graph the entire inequality. Using the x-axis in your graph as a number line, **sketch** the number line solution (using open circles or closed circles at end-points).

d) Does the solution make sense? Why or why not? Try values in the original!

Exercise 2: Solve $x^2+3x-10<0$



a) First graph just $x^2+3x-10$ and sketch the graph.

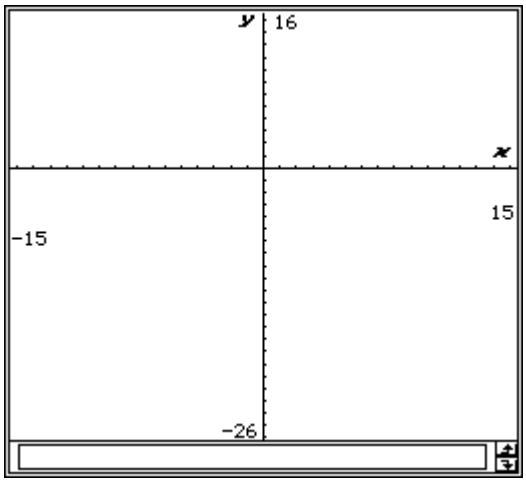
b) Write your estimated solution using set builder notation or interval notation:

_____

c) Next, graph the entire inequality. Using the x-axis in your graph as a number line, **sketch** the number line solution (using open circles or closed circles at end-points).

d) Does the solution make sense? Why or why not?

Exercise 3: Solve $x(x-4)(x+3) \leq 0$



a) First graph just $x(x-4)(x+3)$ and sketch the graph.

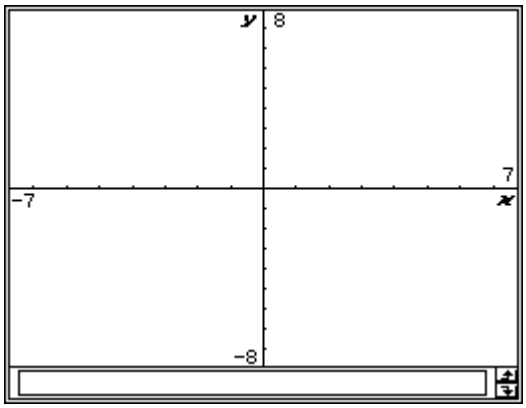
b) Write your estimated solution using set builder notation or interval notation:

_____

c) Next, graph the entire inequality. Using the x-axis in your graph as a number line, **sketch** the number line solution (using open circles or closed circles at end-points).

d) Does the solution make sense? Why or why not?

Extra: Solve $\frac{2x}{x^2-4} \geq 0$



a) First graph just $\frac{2x}{x^2-4}$ and sketch the graph.

b) Write your estimated solution using set builder notation or interval notation:

_____

c) Next, graph the entire inequality. Using the x-axis in your graph as a number line, **sketch** the number line solution (using open circles or closed circles at end-points).

d) What happens to the graph when $x^2-4=0$?