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Graphing Quadratic Equations Using the TI Calculator

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Kristen Frank
TI Technologies

I will begin the class on graphing quadratic equations using the TI-83 plus graphing calculator by reviewing what they know about graphing quadratic equations and what they remember about graphing any kind of graph on the TI-83. We will review this using the overhead projector, creating two columns one that is labeled quadratic equations and the other that is labeled TI-83 graphing. In about 6-8 minutes the students will raise their hands and tell me everything they know about either one of these.

After that we will go over the definition and examples of what a quadratic equation is and how we know longer have to spend 20 minutes graphing it by hand we can now graph it in relatively 5 minutes by using the TI-83 plus. For about 5 minutes we will write down on the overhead step by step what buttons to press to graph an equation while I point the buttons out on the big poster of the calculator hanging in the front of the class room. The students will be following along with the steps on their own calculators. We will first review how to graph a linear equation on the graphing calculator since they have already done this. First they will tell me to go to $y =$ and type in equation $y = 3x + 4$. Then take a quick look at the graph by hitting the graph button. Seeing that it is a straight line we will then go to 2nd graph and take a look at our chart. Reviewing that the chart is where we get our points that we need to plot in order to get the graph we just saw on the previous screen.

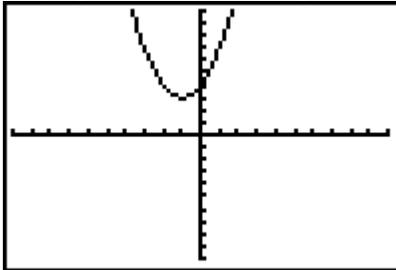
After doing a quick review of what they already know about quadratic equations and the graphing calculator we will then point out how graphing a quadratic is the same steps on the calculator as graphing a linear equation. We will then go back to $y =$ and clear it out, we will put in $x^2 + 2x + 4$ and then go to graph and see that a quadratic is a u shaped figure. The next step will be to go to 2nd graph and look at the chart. Using paper with half of it blank and the other half graph paper with a x-axis and y-axis I will have the students copy down the exact chart from -4 to 2 on the blank side of the paper as it is on the calculator, I will begin showing them how to do this on the board and I will walk around the room to ensure that the class is doing the same. On the other side of the paper I will have the students plot their points and compare what they have drawn with the graph on the calculator. The time of this activity will differ depending on how well the students are doing but it should only take about ten minutes.

Now that the students have the basics of how to graph a quadratic equation on the calculator we can explore the equation more. What happens when we change the c in $y = ax^2 + bx + c$ (raise the graph up or down), what happens if we change the x^2 from a positive to a negative(smiley to a frown) and what happens if the b is changed(moves the graph left or right). Graphing quadratics is very important on exams so we will spend quite a few days graphing quadratics and making sure that the students know they must write down the x and y chart before plotting those exact points on their graph paper, they must label their graphs and write down everything they know about the graph.

1) $y =$
 Plot1 Plot2 Plot3
 $\sqrt{Y_1 =$
 $\sqrt{Y_2 =$
 $\sqrt{Y_3 =$
 $\sqrt{Y_4 =$
 $\sqrt{Y_5 =$
 $\sqrt{Y_6 =$
 $\sqrt{Y_7 =$

2) $x^2 + 2x + 4$
 Plot1 Plot2 Plot3
 $\sqrt{Y_1 = X^2 + 2X + 4$
 $\sqrt{Y_2 =$
 $\sqrt{Y_3 =$
 $\sqrt{Y_4 =$
 $\sqrt{Y_5 =$
 $\sqrt{Y_6 =$
 $\sqrt{Y_7 =$

3) graph – last of the top five buttons



4) 2nd graph – chart of the x and y values for the graph $y = x^2 + 2x + 4$

X	Y ₁	
-4	12	
-3	7	
-2	4	
-1	3	
0	4	
1	7	
2	12	
$X = -4$		

Rubric

1) Could they find $y =$ and type in their equation	1	2	3	4
2) Did they find their chart and write down x and y columns	1	2	3	4
3) Did they plot all their points correctly	1	2	3	4
4) Did they label their graph and answer all questions.	1	2	3	4

