HANDOUT 2.17a

Tutorial Request Form (TRF)
Pre-work Inquiry (Before the Tutorial)

AVID Decades of College Dreams

Subject: Algebra 2

Standard/Essential Question: Solve for the quadratic equation and graph.

Name: Jennifer

AVID Period: 2°

Date: 9/29/11

Pre-Work Inquiry	Resources	Collaborative Inquiry	Note-Taking	Reflection	Total
____/12	____/1	____/2	____/3	____/7	____/25

Initial/Original Question: Source, Page # and Problem #: _____

Solve the following quadratic equation and graph it: $y = x^2 + 2x + 3$ /1

Key Academic Vocabulary/Definition Associated With Topic/Question:

1. Completing the square - a process used to make a quadratic expression into a perfect square trinomial.
2. parabola - set of all points in a plane that are the same distance from a given point. /2

What I Know About My Question:

1. Part of transforming the equation is using completing the square.
2. The first step to graphing after transforming the equation is finding and plotting the vertex. /2

Critical Thinking About Initial Question:

$y = x^2 + 2x + 3$

$y - 3 + \underline{?} = x^2 + 2x + \underline{?}$

vertex : $\underline{?}$

- You are supposed to graph the inequality and end up with a parabola.
- But 1st you are supposed to turn the equation to $y = a(x-h)^2 + k$

x			
y			

vertex (h, k) /3

Identify General Process and Steps:

1. To transform the equation you have to start by completing the square.
2. Since you are supposed to graph the equation, that's why you change it to $y = a(x-h)^2 + k$
3. You find the vertex to plot the first point of the equation
4. Use a "x" and "y" table to find the other points. /2

Question From Point of Confusion: By using my prior knowledge of completing the square, how do I transform the equation into vertex form and what is the process for finding the points? /2

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Three-Column Note-Taking (In Class—During the Tutorial)

Take three-column notes (question/notes/steps or process) during the tutorial on notebook paper. Keep your notes in your binder to study.

Reflection (In Class—After the Tutorial)

My point of confusion is based on a focus area from my Tutorial Analysis Grade Reflection: ☒ Yes ☐ No

I was a student presenter during tutorial today: ☒ Yes ☐ No

In the space below, elaborate on the following questions as you reflect on the tutorial process: What was your/the point of confusion? What did you learn about the point of confusion? When/how did you gain a new/greater understanding about the point of confusion? How does this new learning connect to previous learning/experiences, yourself and/or the world? What did you find meaningful about the tutorial session?

/7

My point of confusion was how to transform the equation into vertex form and how to find the points to graph the parabola after you have found the vertex. From my point of confusion, I learned how to use the "x" and "y" table to find the points. I gained a greater understanding about my point when I was solving for the vertex. Graphing the quadratic connects to my previous learning of regular graphs. What I found meaningful was the process of finding the vertex because I wasn't just learning how to solve for the vertex, but also I was learning how to complete the square.

Jennifer's 3-Column Notes

TRF

POC ?

By using my prior knowledge of completing the square, how do I transform the equation into vertex form and what is the process for finding the points?

Notes

$y = x^2 + 2x + 3$

$y - 3 + \underline{?} = x^2 + 2x + \underline{?}$

$\left(\frac{b}{2}\right)^2 = \left(\frac{2}{2}\right)^2 = \boxed{1}$

$y - 3 + 1 = x^2 + 2x + 1$

$y - 2 = x^2 + 2x + 1$

1 x 1 > 1 + 1 > $\boxed{2}$

1 x 1

$y = a(x-h)^2 + k$

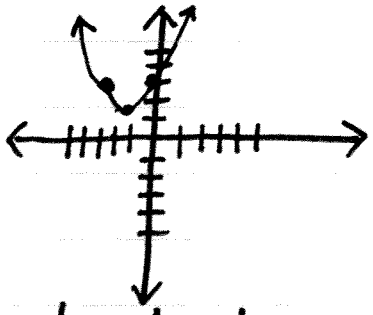
vertex : (h, k)

$y - 2 = (x+1)^2$

+2 +2

$\boxed{y = (x+1)^2 + 2}$

vertex : $(-1, 2)$



x	-2	-1	0
y	3	2	3

$y = (0+1)^2 + 2$

$y = (1)^2 + 2$

$y = 1 + 2 \rightarrow \boxed{y = 3}$

$y = (-2+1)^2 + 2$

$y = (-1)^2 + 2$

$y = 1 + 2 \rightarrow \boxed{y = 3}$

Steps

1) Use completing the square
2) Fill in the blanks
3) Factor the right side of equation
4) Add (the 2)
5) Find the vertex
6) Find the points near the vertex, plug them into the equation
7) Graph using those points

Jennifer's Content Class Notes

Graphing Quadratics

How does the vertex affect the entire graph?

1. In order to graph quadratics (parabolas), we have to know how to find the vertex

- Finding the vertex depends on the equation form

How can finding the vertex using vertex form be easier than with standard form?

2.

Standard Form	Vertex Form
$f(x)=ax^2+bx+c$	$y=a(x-h)^2+k$
vertex is at $x=\frac{-b}{2a}$	vertex = (h,k)

"k" - vertical translation
"h" - horizontal translation

How else can you solve for the equation if it is not a perfect square?

3. • The completing the square can be used to solve when the quadratic is a perfect square

- Step 1 - Find ½ of b, the coefficie of x
  Step 2 - Square the result in #1
  Step 3 - Add the rest of #2 to x^2+bx
  symbols: $x^2+bx+\left(\frac{b}{2}\right)^2=\left(x+\frac{b}{2}\right)^2$

Summary: The vertex is the point at which the axis of symmetry intersects a parabola, so if you mess it up, the entire graph is messed up. Using vertex form is easier because you just need to take h & k as the vertex. If the equation is not a perfect square then you can use the square root property to solve.