COMPLETING THE SQUARE

AGENDA

Warm-Up

Extra Credit Opportunity

Notes

HW #1-6

REMINDERS

All tests/quizzes/ notebook check must be completed tmr by 4:10.

Extra credit due Thurs. 9AM

Turn in bathroom passes!!

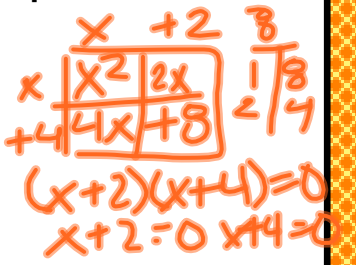
WARM UP MONDAY

1. If you didn't have your calculator, which quadratic would be easier to solve?

a. $x^2 + 6x + 8 = 0$

$a:1 \quad b:6 \quad c:8$

$x = \frac{-6 \pm \sqrt{6^2-4(1)(8)}}{2(1)}$



b. $\frac{2(x-1)^2}{2} = \frac{8}{2}$

Now solve it.

$\sqrt{(x-1)^2} = \sqrt{4}$

$x-1 = \pm 2$

$x-1=2$ and $x-1=-2$

$+1 \quad +1 \qquad +1 \quad +1$

$x=3 \qquad x=-1$

2. Write how you think you did on your algebra simulation. Was there any type of question you struggled with? What was it?

EXTRA CREDIT

Algebra 1
Quadratics in Real-Life Project

Name _____ due Thurs. 9AM

Objective: To identify Quadratics in Real-Life

- ☐ Find a Quadratic Function (not a semi-circle with two vertical lines attached to it) in real-life and take a photograph of it.
- ☐ Write a paragraph of at least 5 sentences describing your parabola and where you found it. You must use the following words in your paragraph:
  - Quadratic function
  - Vertex
  - Maximum or Minimum
  - Parabola
- ☐ Post your paragraph and picture on the padlet (http://goo.gl/XDRsdg)
- ☐ The title of your post should be your name.

Example:

Mathematics in Real-Life: A Parabola

I saw this bridge shaped like a parabola in downtown Dallas. We drove over the bridge and under the parabola in our car. A Parabola is a U-shaped graph of a Quadratic Function. A parabola has either a maximum or a minimum point called the Vertex. This parabola opens down and has a vertex that is a maximum. This parabolic structure supports the bridge below.

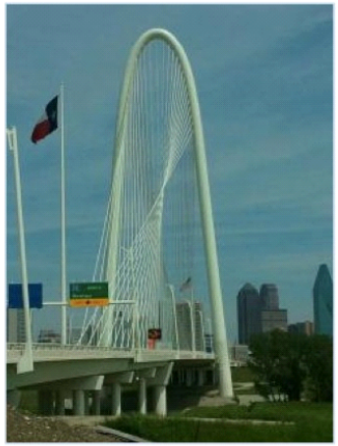


Photo taken on 4/7/2012

Mrs. Valenzuela

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Quadratics in Real-Life Grading Rubric

_____Item is a parabola and not a semi-circle with two vertical lines. (10 points)

_____"Quadratic Function" is included and described correctly. (10 points)

_____"Vertex" is included and described correctly. (10 points)

_____"Maximum or Minimum" is included and described correctly. (10 points)

_____"Parabola" is included and described correctly. (10 points)

_____ Item is a photograph and not a picture found on the Internet. (10 points)

_____ Where item was located is included in paragraph. (10 points)

_____ Paragraph contains 5 complete sentences. (10 points)

_____ Sentences are grammatically correct and contain no punctuation or spelling errors. (10 points)

_____ Name is included as a title. (10 points)

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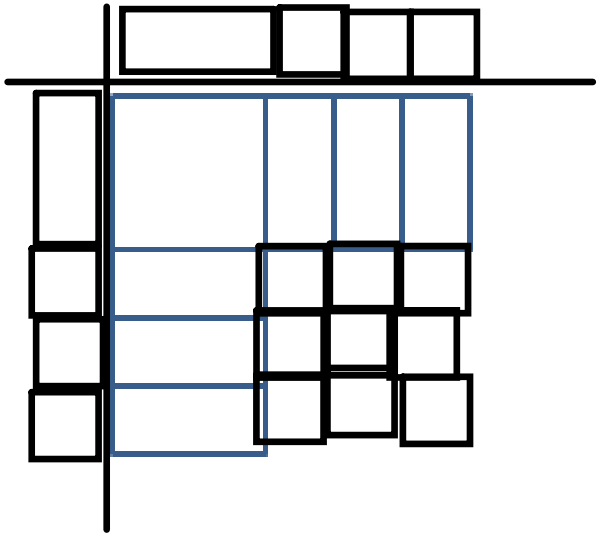
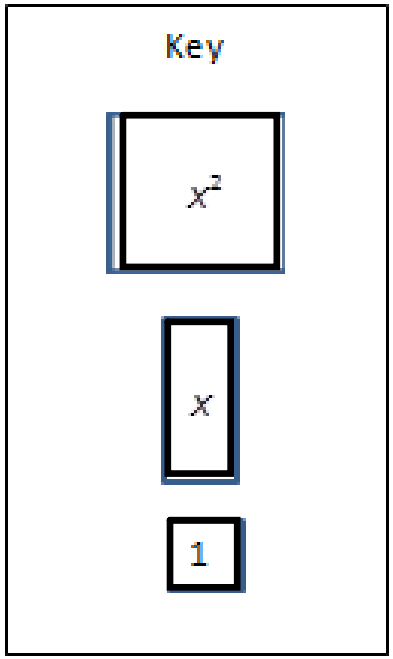
COMPLETING THE SQUARE

1. Goal: complete the figure to make a square.



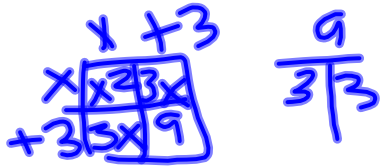


a. Explain what you did to make a square shape.

Add ones (9)

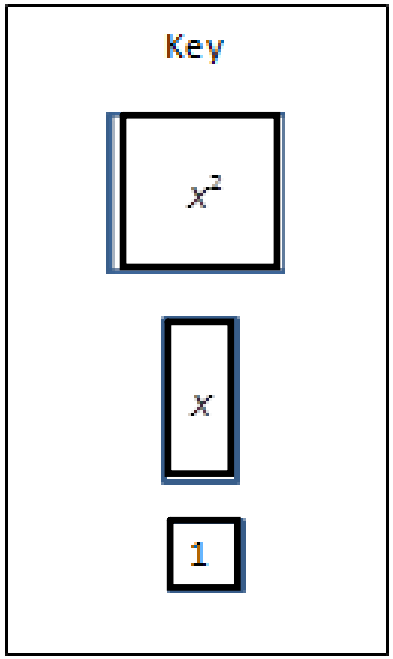
b. What polynomial represents the completed square?

$x^2 + 6x + 9$

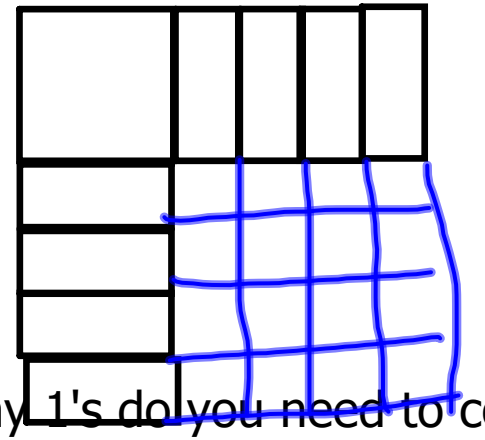


COMPLETING THE SQUARE

2. Goal: complete the figure to make a square.



a. Rearrange the shapes to make the same amount of x's on each side (like the figure in #1). Sketch the picture.



b. How many 1's do you need to complete the square shape?

16

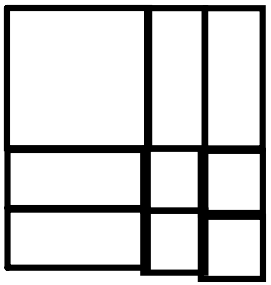
c. What polynomial represents the completed square shape?

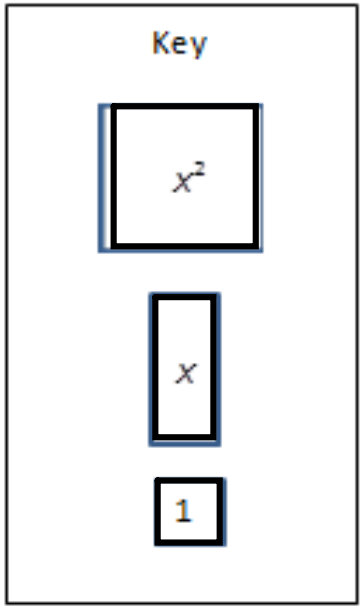
$x^2+8x+16 = (x+4)^2$

COMPLETING THE SQUARE

3. Goal: complete the figure to make a square.

a. Draw a figure to represent the polynomial expression $x^2 + 4x$. Make sure to draw the same amount of x's on each side of the figure (like in #1 and #2)





b. How many 1's do you need to complete the square shape? 4

c. What polynomial represents the completed square shape? $x^2+4x+4 = (x+2)^2$

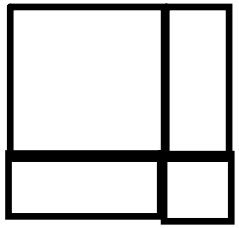
d. What is true about every polynomial of the completed square shapes?

constant: perfect square / b value: even / factors are square

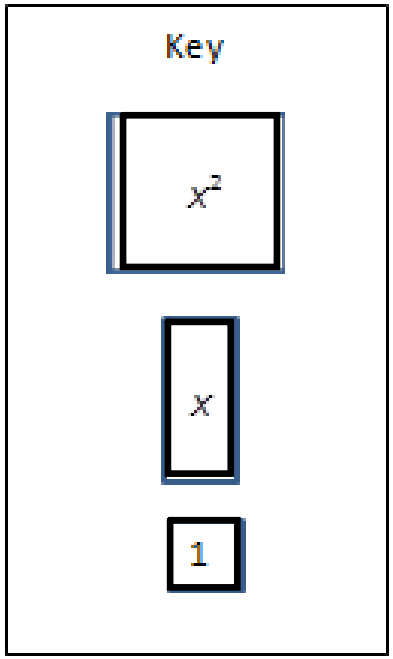
$x^2+8x+16$ x^2+6x+9

COMPLETING THE SQUARE

4. Goal: complete the square of the polynomial expression $x^2 + 2x +$ __1__.



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



COMPLETING THE SQUARE

5. Goal: Use completing the square to solve an **equation**. Remember to keep things balanced.

a. Step 1: move constants to other side

b. Step 2: complete the square

c. Step 3: Factor (find the length of square)

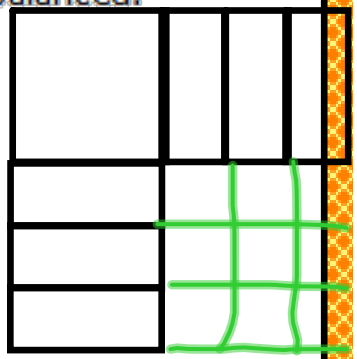
d. Step 4: square root both sides

e. Step 5: simplify (don't forget ±)

f. Step 6: split equations & solve for x

a. $x^2+6x-16=0$

$+16 \quad +16$



b. $x^2+6x+\underline{9}=16+\underline{9}$

$(x+3)(x+3)$

c. $(x+\underline{3})^2=\underline{25}$

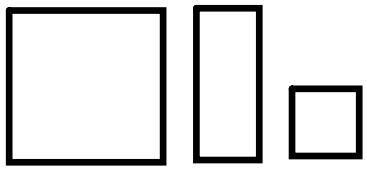
d. $\sqrt{(x+\underline{3})^2}=\pm\sqrt{\underline{25}}$

e. $x+\underline{3}=\pm\underline{5}$

f. $x+\underline{3}=+\underline{5}$ and $x+\underline{3}=-\underline{5}$

$-3 \quad -3 \quad -3 \quad -3$

x=2 and x=-8

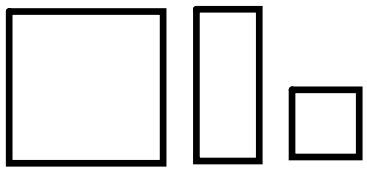


COMPLETING THE SQUARE

Concept Check

Complete the square to solve the equation!

$$x^2 + 8x = -12$$



Passing - 43% - 24 right

Algebra 1 Unit 8 Completing the Square Day 1

Practice – Completing the Square Day 1

Name _____ **Date** _____ **Period** ____

1. Draw a tiles to represent the polynomial $x^2 + 10x$.

2. How many small "1" squares would you use to complete the square shape?

3. What is the polynomial that represents the completed square shape?

4. Using what you know in questions #1-3, use completing the square to solve the equation $x^2 + 10x = 11$.

Solve by completing the square.

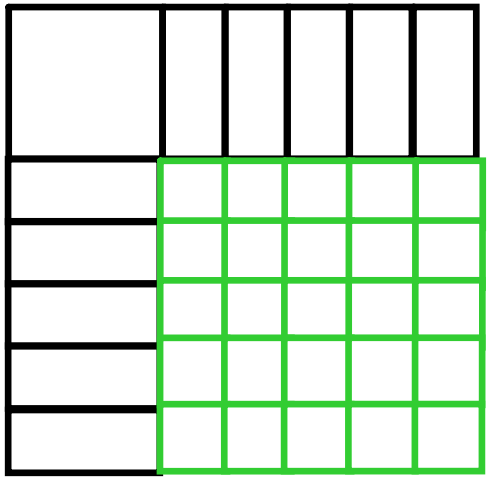
5. $x^2 - 8x - 1 = 8$

6. $x^2 + 4x = 12$

HW HELP: COMPLETING THE SQUARE

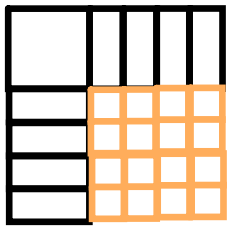
No work = no credit = no kidding!

1.



$$x^2+10x+25=11+25$$
$$(x+5)^2=36$$
$$\sqrt{(x+5)^2}=\sqrt{36}$$
$$x+5=\pm 6$$
$$x=5+6$$
$$x=5-6$$
$$x:\{-1,11\}$$

5. Add 1 to both sides before beginning! Answer: {-1, 9}



6. {-6, 2}