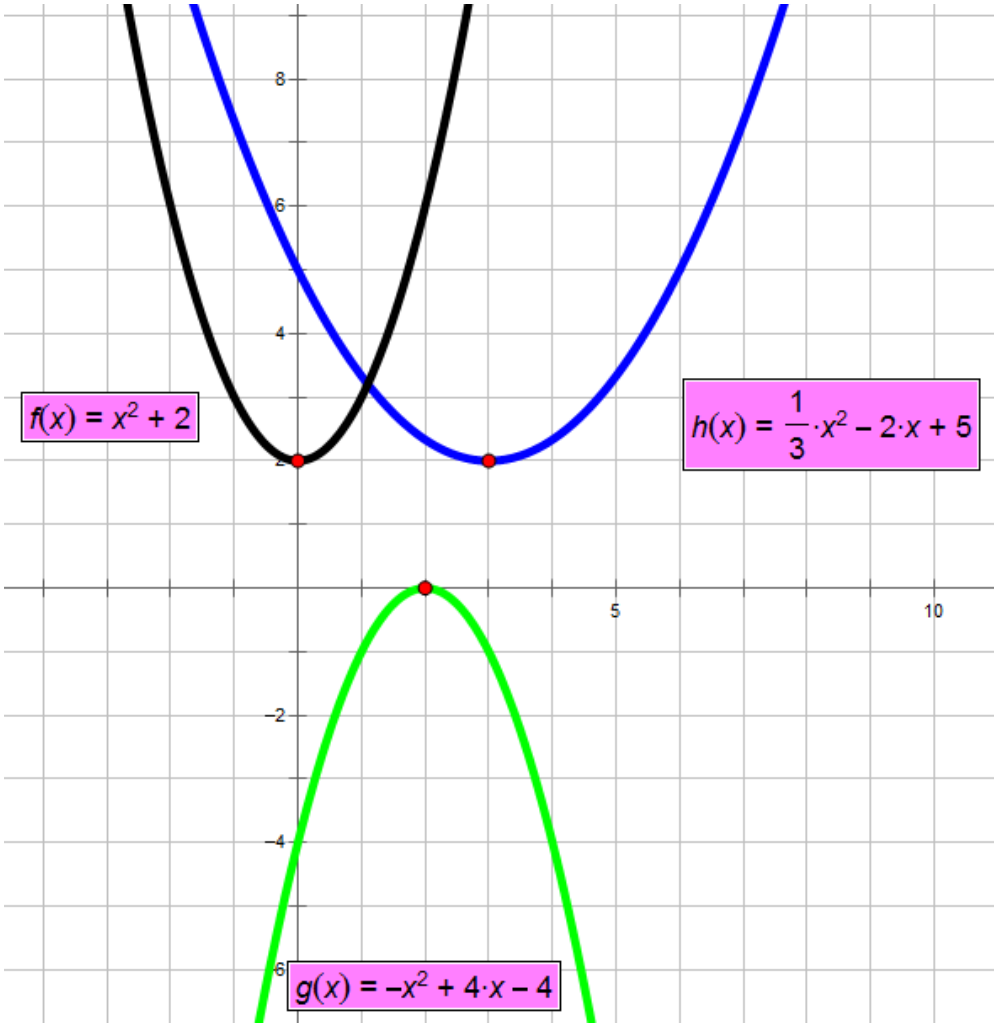
DO NOW

- Graph the following using a graphing calculator in the same view:

1. $y = x^2 + 2$
2. $y = -x^2 + 4x - 4$
3. $y = \frac{1}{3}x^2 - 2x + 5$

GRAPHS: SIMILARITIES AND DIFFERENCES



ESSENTIAL QUESTIONS

- What are the key characteristics of quadratic functions and their graphs?
- How are they key characteristics of quadratic functions similar and different to the key characteristics of linear functions?
- How do changes in the parameters of a quadratic function effect the shape and position of its graph?
- How can the graph of a function be used to determine the domain and range of the function?
- How do you identify a situation where a quadratic model would be most appropriate?
- What makes a complex number complex?
- How do you represent the square root of a negative number?
- How do you perform operations with complex numbers?

LEARNING GOAL

- SWBAT:
  - Solve quadratic equations algebraically and graphically given an equation.
  - Determine the zeros of a quadratic function algebraically and graphically given an equation.

CLASS AGENDA

- Do Now
- Solving quadratic equations
- Break
- Finding the zeros of quadratic equations
- Closure
- Homework – Worksheet

SOLVE FOR THE VARIABLE

1. $64 = x^2$

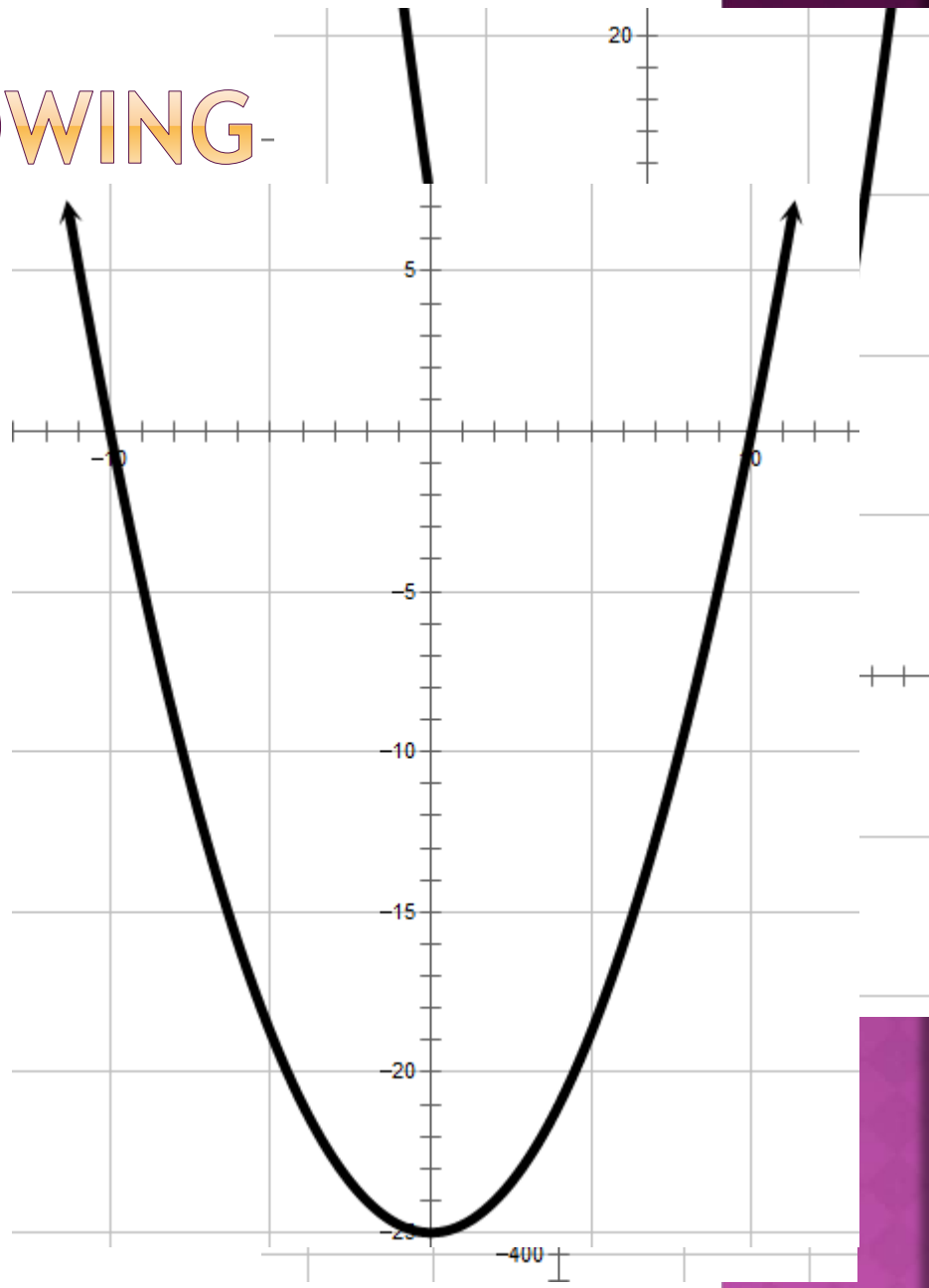
2. $200 = 3x^2 - 163$

3. $0 = \frac{1}{2}x^2 - 8$

4. $25 = \frac{1}{4}x^2$

GRAPH THE FOLLOWING

1. $y = x^2 - 64$
2. $y = 3x^2 - 363$
3. $y = \frac{1}{2}x^2 - 8$
4. $y = \frac{1}{4}x^2 - 25$



BREAK

DETERMINING THE ZEROS

1. What are the zeros of a quadratic function?

2. How do we solve for them?
    1. Set the equation equal to zero
    2. Solve for the remaining variable
        1. Factor if possible
        2. Use the quadratic equation if necessary

FACTORING

1. *With NO coefficient of the squared term*
   - x-factor video: Click Here
   - URL: http://youtu.be/vVWm2gyROQQ

2. *With a coefficient of the squared term*
   - x-factor and box method video: Click Here
   - URL: http://youtu.be/FxTiogyhwfc

COMPLETING THE SQUARE

- When you cannot factor a quadratic equation
  - Completing the square video: Click Here
  - URL: http://youtu.be/GyCuj1hx_zc

QUADRATIC FORMULA

$$y = ax^2 + bx - c$$

Formula:

$$\frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

FIND THE ZEROS USING ANY METHOD

1. $3x^2 - 4x - 7 = 0$
2. $x^2 - 10x - 1575 = 0$
3. $x^2 - 8x - 20 = 0$
4. $4x^2 - 8x - 32 = 0$
5. $5x^2 + 2x - 1 = 0$
6. $4x^2 - 4x - 17 = 0$

CLOSURE

CLOSURE

- How many solutions do you have for a quadratic equation?
- What are the zeros of a quadratic equation and how do you find the zeros of a quadratic equation?