

DO NOW

⦿ Rewrite each equation into function form:

■ $f(x) = a^2 + bx + c$

1. $x^2 + 7x = -12$

2. $x^2 - 16 = 0$

3. $2x^2 + 3x - 9 = 0$

ESSENTIAL QUESTIONS

- ◉ What are the key characteristics of quadratic functions and their graphs?
- ◉ How are the 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 affect 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:

- Analyze graphs of quadratic functions given an equation of the function.

CLASS AGENDA

- ⦿ Do Now
- ⦿ Analyze the components
- ⦿ Break
- ⦿ Graph the functions
- ⦿ Closure

TRANSLATIONS

- ⊙ *Using the parent function: $f(x) = x^2$*
- ⊙ *Graph the following and compare the functions to the parent function:*
 - $h(x) = x^2 + 2$
 - $h(x) = x^2 - 2$
 - $h(x) = (x - 2)^2$
 - $h(x) = (x + 2)^2$
- ⊙ *Do you think these relationships will always hold true?*

GRAPH THE FOLLOWING

⊙ $h(x) = (x - 1)^2 + 4$

⊙ $h(x) = (x - 1)^2 - 4$

⊙ $h(x) = (x + 1)^2 + 4$

⊙ $h(x) = (x + 1)^2 - 4$

⊙ *What do you notice?*

GRAPH THE FOLLOWING

- ◉ $f(x) = x^2$

- ◉ $g(x) = -x^2$

- ◉ $g(x) = -(x)^2$

- ◉ *What do you notice?*

GRAPH THE FOLLOWING

- $f(x) = x^2$

- $h(x) = 2x^2$

- $h(x) = \frac{1}{2}x^2$

- *What do you notice?*

BREAK

GRAPHING

⊙ Graph on the same axis

1. $f(x) = x^2$

2. $f(x) = x^2 - 6x$

3. $f(x) = x^2 - 6x + 9$

4. $f(x) = x^2 - 6x + 10$

GRAPHING

⊙ Graph on the same axis

1. $f(x) = x^2$

2. $g(x) = -x^2 + 4x$

3. $g(x) = -x^2 + 4x - 4$

4. $g(x) = -x^2 + 4x - 8$

GRAPHING

⊙ Graph on the same axis

1. $f(x) = x^2$

2. $g(x) = 2(x - 2)^2$

3. $g(x) = 2(x - 2)^2 + 4$

4. *What do you notice?*

GRAPHING

⊙ Graph on the same axis

1. $f(x) = x^2$

2. $g(x) = -3(x + 1)^2$

3. $g(x) = -3(x + 1)^2 - 5$

4. *What do you notice?*

CLOSURE (EXIT TICKET)

EXIT TICKET

○ In standard form:
■ What affect do a, b, and c have on the graph?

○ In vertex form:
■ What affect do a, h, and k have on the graph?

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