Starter(s):

1.) Find the vertex for the quadratic function. 2. Answer the following questions below.

 $y= -x^{2}+8x + 9$

Use the graph above to answer the questions

1. Vertex: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. Axis of symmetry: \_\_\_\_\_\_\_\_
3. Domain: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. Range: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
5. Y-Intercept: \_\_\_\_\_\_\_\_\_\_\_\_\_
6. X-Intercepts: \_\_\_\_\_\_\_\_\_\_\_\_

Notes Topic: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_



Answer: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Background:

A parabola \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ y-intercept, which you can find by looking at the value of \_\_\_\_\_\_\_\_\_.

Examples:

What is the y-intercept to the following quadratic functions?

1. $y= x^{2}-x$ Answer: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. $y= x^{2} + 4x-16$ Answer: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. $ y= x^{2} $ Answer: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Notes:

A parabola can have \_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_, or \_\_\_\_\_\_\_\_\_\_ x-intercepts depending on whether the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ or \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and whether the parabola opens \_\_\_\_\_\_\_\_\_\_\_\_ or \_\_\_\_\_\_\_\_\_\_\_\_.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Big Idea:

We can determine how many \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ a quadratic equation has based on how many \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ the graph of its corresponding function would have.

For #1 – 2, graph each quadratic function *algebraically* and answer the following questions.

1.) $y=x^{2}+6x+9$



Domain: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Range: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Vertex: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Axis of symmetry: \_\_\_\_\_\_\_\_\_\_\_

Y-intercept: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ # of X-Intercepts: \_\_\_\_\_\_\_\_\_\_\_

Min OR Max: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2.) $y=-x^{2}+2x+3$



Domain: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Range: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Vertex: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Axis of symmetry: \_\_\_\_\_\_\_\_\_\_\_

Y-intercept: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ # of X-Intercepts: \_\_\_\_\_\_\_\_\_\_\_

Min OR Max: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

YOU TRY:

3.) $y=2\left(x-2\right)^{2}+3$



Domain: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Range: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Vertex: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Axis of symmetry: \_\_\_\_\_\_\_\_\_\_\_

Y-intercept: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ # of X-Intercepts: \_\_\_\_\_\_\_\_\_\_\_

Min OR Max: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_



Domain: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Range: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Vertex: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Axis of symmetry: \_\_\_\_\_\_\_\_\_\_\_

Y-intercept: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ # of X-Intercepts: \_\_\_\_\_\_\_\_\_\_\_

Min OR Max: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Domain: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Range: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Vertex: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Axis of symmetry: \_\_\_\_\_\_\_\_\_\_\_

Y-intercept: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ # of X-Intercepts: \_\_\_\_\_\_\_\_\_\_\_

Min OR Max: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_



\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_



POTD:

A golf ball hit on the moon with an initial speed of 18 feet per second has a height, *h*, in feet given by the function, where *t* represents the number of seconds after the ball was hit.

1. If the ball reaches its greatest height after 3 seconds, what is this greatest height?
2. At what point(s) in time is the ball at a height of 24 feet?
3. Create a graph of the function on the grid below for all values of *t* on the interval.

 Make sure to properly label your axes.

1. How many seconds does it take for the ball to hit the ground?
2. Looking at your answer(s) to part (d), is there another way to find when the ball will hit the ground *algebraically*? (Hint: What is the height of the ball when it is on the ground and which variable represents height in the equation?) Explain how you get your answer.

Big Idea:

If a quadratic equation has \_\_\_\_\_\_\_\_\_ or \_\_\_\_\_\_\_\_\_ solutions, then sometimes we can find those solutions by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Steps: To find the solutions of a quadratic equation by factoring…

#1 – Move all the terms to the \_\_\_\_\_\_\_\_\_\_\_\_\_\_ side of the equation using \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 or \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ so the right side of the equation is now \_\_\_\_\_\_\_\_\_.

#2 – If possible, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ each term by the \_\_\_\_\_\_\_\_ value.

#3 – \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_!

#4 – Set each parenthesis equal to \_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Examples:

1.) $a^{2} - 14a + 48 = 0$ 2.) $h^{2} - 5h - 26 = 10$

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

3.) $p^{2} + 2p = 120$ 4.) $r^{2} = 7r - 6$

5.) $- w^{2} + 8w + 57 = 2w - 15$ 6.) $24m - 48 = 3m^{2}$

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

7.) $- 2n^{2} - 240 = 46n$ 8.) $c^{2} = 36$

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

9.) $6k^{2} - 17k + 5 = 0$ 10.) $12d^{2}=11d + 15$

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Result:

The solutions you just found for all the above questions represent the\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ or \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. This is where the quadratic will cross the\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Block:\_\_\_\_\_\_\_

Quadratics: Solve by Factoring

Directions: Solve each quadratic equation for the given variable (show all your work).

1.) $a^{2} + 19a + 84 = 0$ 2.) $h^{2} - h - 50 = 22$

3.) $p^{2} + 6p = 135$ 4.) $r^{2} = 20r - 100$

5.) $- 2w^{2} - 24w + 200 = 72$ 6.) $36m = 144 - 4m^{2}$

7.) $180 = 2n^{2} - 18n$ 8.) $- 5c^{2}+ 62 =17$

9.) $10k^{2} - 41k + 21 = 0$ 10.) $4d^{2} + 15d = 54$