

## Concept: Quadratic Functions

Name: \_\_\_\_\_

- You should have completed Equations – Section 5 Part A: Problem Solving before beginning this handout.

### PART B: COMPUTER COMPONENT


**Instructions:** In  follow the **Content Menu** path:

**Graphing > Quadratic Functions**

NOTE: Use the **Menu** button in order to get to the lesson where you left off.

 Work through all Sub Lessons of the following Lessons **in order**:

- *Intercepts of a Quadratic Function*
- *Examples*
- *Maximize Cage Area*
- *Maximize Potato Income*
- *Bob's Beach Ball*
- *Hit the Brakes!*

 As you work through the computer exercises, you will be prompted to make notes in your notebook/math journal.

### NOTES

#### 1. Intercepts of a Quadratic Function

(a) **Method 1:** Finding the intercepts from a \_\_\_\_\_.

When do the x-intercepts occur? \_\_\_\_\_

When do the y-intercepts occur? \_\_\_\_\_

(b) **Method 2:** Finding the intercepts by \_\_\_\_\_.

*Step 1.* Set  $y =$  \_\_\_\_\_

*Step 2.* \_\_\_\_\_ the right side of the equation.

*Step 3.* Set the factors equal to \_\_\_\_\_.

*Step 4.* Solve for \_\_\_\_\_.

The solutions that we get are actually the points at which the graph cuts the \_\_\_\_\_.

(c) **Method 3:** Finding the intercepts using the \_\_\_\_\_ Formula.

The formula is: \_\_\_\_\_

### PART B: OFF COMPUTER EXERCISES

1. Given the quadratic function  $y = x^2 + 2x - 8$ ,

(a) Find the x-intercepts by factoring. (*Remember to set  $y=0$* )

(b) Find the y-intercepts.

2. Given the quadratic function  $x^2 - 9x - 22$ ,

(a) Find the x-intercepts by using the quadratic formula.

(b) Find the y-intercepts.

3. Given the quadratic function  $x^2 - 13x + 40$ ,

(a) find the x-intercepts by factoring.

(b) find the x-intercepts by using the quadratic formula.

4. Fill in the blanks.

(a)  $y = -x^2 + 2x + 3$  is a \_\_\_\_\_ function.

(b) Its graph is a \_\_\_\_\_.

(c) The curve is concave because \_\_\_\_\_.

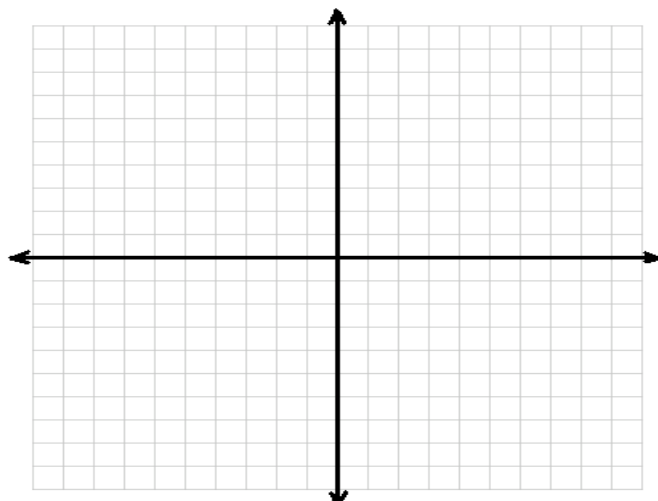
(d) The x-value of the vertex is \_\_\_\_\_.

(e) The y-value of the vertex is \_\_\_\_\_.

(f) The axis of symmetry is  $x =$  \_\_\_\_\_.

(g) Find the x-intercepts by factoring.

(h) Sketch the graph.



5. Fill in the blanks.

(a)  $y = x^2 + 10x + 24$  is a \_\_\_\_\_ function.

(b) Its graph is a \_\_\_\_\_ .

(c) The curve is concave because \_\_\_\_\_ .

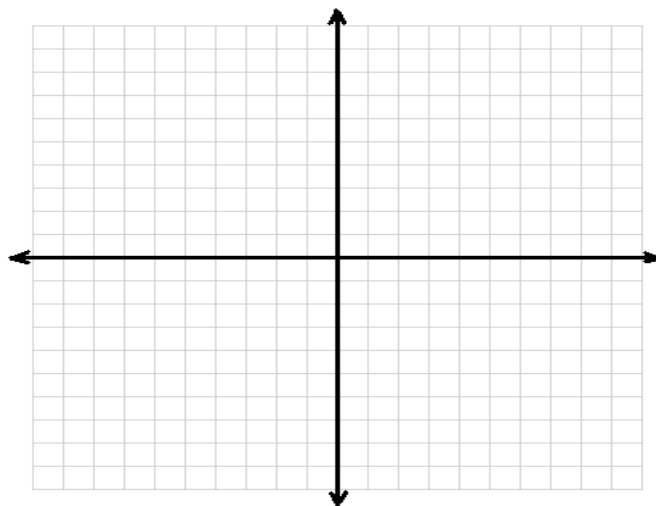
(d) The x-value of the vertex is \_\_\_\_\_ .

(e) The y-value of the vertex is \_\_\_\_\_ .

(f) The axis of symmetry is  $x =$  \_\_\_\_\_ .

(g) Find the x-intercepts by factoring.

(h) Sketch the graph.



6. Farmer George has a cow pasture to enclose. He has 160m of fence. *What dimensions should he make the enclosure so that the cow pasture is covering the maximum amount of area?*



*(Remember to figure out how long  $\frac{1}{2}$  of the fence is first, then call one of the 4 sides  $x$ )*

7. Carl tosses a baseball into the air and then catches it.  
 $y = 48t - 9t^2$  describes the equation of motion of the baseball.  
*What was the maximum height reached by the ball?*