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

Quadratically Inclined

Quadratic Functions can be written in Factored Form:

 *f* (*x*) = a (*x* – *r*1) (*x* – *r*2)

 Example:

 *f* (*x*) = 1 (*x* – 5) (*x* + 2)

Quadratic Functions can be written in Standard Form:

 $f\left(x\right)=ax^{2}+bx+c$

 Example:

 $f\left(x\right)=2x^{2}+4x-5$

Quadratic Functions can be written in Vertex Form:

 $f\left(x\right)=a(x-h)^{2}+k$

 Example:

 $f\left(x\right)=-3(x+6)^{2}+7$

The coefficient **a** in the quadratic function indicates the opening of the parabola.

1.When **a** is positive, the parabola opens \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2. When **a** is negative, the parabola opens \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_



The coefficient **a** in the quadratic function indicates the width of the parabola

(Hint: use the graphs to the right!)

3. When **a** is a fraction, the parabola is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

4. When **a** is a number greater than one,

 the parabola is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

5. When the quadratic function is written in standard form, the factors will indicate the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of the function.

6. When the quadratic function is written in vertex form, the factors will indicate the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of the function.

7. When the quadratic function is written in factored form, the factors will indicate the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of the function.

**Use the equations give to find either the y-intercept, vertex, or factors of the quadratic.**

8*.* $f\left(x\right)=-2x^{2}-8x-11$The y-intercept of the function is \_\_\_\_\_\_\_\_\_\_\_\_\_

*9.* $f\left(x\right)=-2(x+2)^{2}-2$The vertex of the function is \_\_\_\_\_\_\_\_\_\_\_\_\_

*10.*$f\left(x\right)=5(x+12)(x-2)$The zeros of the function are \_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_

11*.* $f\left(x\right)=-x^{2}+8x-18$The y-intercept of the function is \_\_\_\_\_\_\_\_\_\_\_\_\_

*12.* $f\left(x\right)=-(x-3)^{2}-1$The vertex of the function is \_\_\_\_\_\_\_\_\_\_\_\_\_

*13.*$f\left(x\right)=-2(x+1)(x+10)$The zeros of the function are \_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_

14*.* $f\left(x\right)=2x^{2}-12x+15$The y-intercept of the function is \_\_\_\_\_\_\_\_\_\_\_\_\_

*15.* $f\left(x\right)=2(x+1)^{2}+4$The vertex of the function is \_\_\_\_\_\_\_\_\_\_\_\_\_

*16.*$f\left(x\right)=8(x-4)(x+5)$The zeros of the function are \_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_

**Use the information given to write a quadratic equation in either vertex or factored form.**

17. The vertex of the function is (4, -3) and the parabola opens upward.

 *f* (*x*) = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

18. The zeros of the function are (-5, 0) and (4, 0) the parabola opens downward.

 *f* (*x*) = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

19. The zeros of the function are (-8, 0) and (3, 0) the parabola opens downward.

 *f* (*x*) = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

20. The vertex of the function is (3, -4) and the parabola opens upward.

 *f* (*x*) = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

21. The zeros of the function are (5, 0) and (2, 0), the parabola opens downward.

*f* (*x*) = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

22. The vertex of the function is (-2, 0), the parabola opens upward.

*f* (*x*) = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

23. Label the following key characteristics on the graph below:

1. Vertex
2. Zeros
3. Draw the axis of symmetry and label it.

**Use the graph at the right to answer the following**

**questions:**

24) What is the vertex of the parabola?

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

25) What are the zeros of the function?

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

26) Does the function have a maximum or a minimum?

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

