

## Guided Notes for Quadratic Functions

## DOMAIN AND RANGE

<b>Domain</b>	$\Rightarrow$	<b>Range</b>
All possible $x$ -values		All possible $y$ -values
Independent		Dependent (on $x$ )

Domain for the Graph: \_\_\_\_\_

Range for the Graph: \_\_\_\_\_

or

\_\_\_\_\_

Domain for the Problem: \_\_\_\_\_

Range of the Problem: \_\_\_\_\_

CALCULATING 1<sup>ST</sup> AND 2<sup>ND</sup> DIFFERENCES

\_\_\_\_\_

\_\_\_\_\_

x	y	difference of y-values
-2	-4	} $-1 + 4 = 3$
-1	-1	
0	2	} $2 + 1 = 3$
1	5	
2	8	} $5 - 2 = 3$

**Linear Functions**1<sup>st</sup> Differences are \_\_\_\_\_2<sup>nd</sup> Differences are \_\_\_\_\_**Quadratic Functions**1<sup>st</sup> Differences are \_\_\_\_\_2<sup>nd</sup> Differences are \_\_\_\_\_**PARABOLAS - THE GRAPH OF A QUADRATIC FUNCTION**Open \_\_\_\_\_ if the leading coefficient (# in front of  $x^2$ ) is \_\_\_\_\_Open \_\_\_\_\_ if the leading coefficient (# in front of  $x^2$ ) is \_\_\_\_\_

## X-INTERCEPT(S) OR ZEROS

Point  $(x, y)$  where the \_\_\_\_\_

Written as  $(r_1, 0)$  and  $(r_2, 0)$ , where  $r_1$  and  $r_2$  are the  $x$ -intercepts.

On a Graph, it is the point(s) where the parabola \_\_\_\_\_

For a Quadratic Function in Factored Form, \_\_\_\_\_

For example,  $f(x) = 3(2x - 8)(x + 7)$

$$2x - 8 = 0 \quad x + 7 = 0$$

$$x = 4 \quad x = -7$$

The  $x$ -intercepts are  $(4, 0)$  and  $(-7, 0)$ .

## Y-INTERCEPT

Point  $(x, y)$  where the \_\_\_\_\_

Written as  $(0, c)$

For a Graph, it is the point where the parabola \_\_\_\_\_

For a Quadratic Function, \_\_\_\_\_

The  $y$ -intercept is usually the \_\_\_\_\_ in the standard form of a quadratic function -  $f(x) = ax^2 + bx + c$ .

## VERTEX

\_\_\_\_\_, midway between the  $x$ -intercepts or 2 symmetric points.

Written as  $(x, y)$ .

**Absolute Maximum** = \_\_\_\_\_

**Absolute Minimum** = \_\_\_\_\_

To Find the Vertex,

On a Graph, identify the  $x$ - and  $y$ -coordinates of the highest or lowest point.

For a Quadratic Function in Standard Form -  $f(x) = ax^2 + bx + c$ , \_\_\_\_\_

For a Quadratic Function in Vertex Form -  $f(x) = a(x - h)^2 + k$ , \_\_\_\_\_

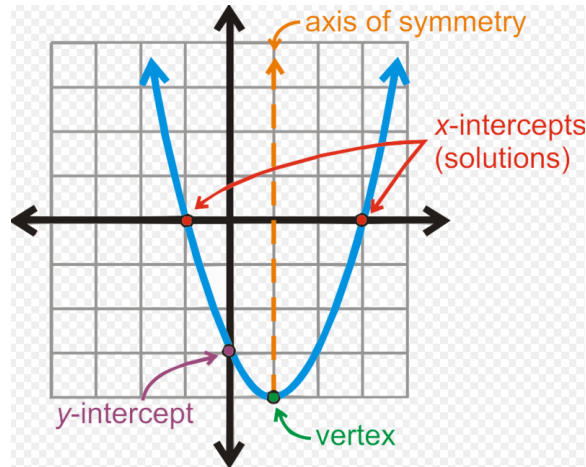
## AXIS OF SYMMETRY

Written as  $x =$  the  $x$ -coordinate of the vertex.

To Find the Axis of Symmetry...

On a Graph, \_\_\_\_\_

Given the  $x$ -intercepts or 2 symmetric points, \_\_\_\_\_



### THREE FORMS OF A QUADRATIC FUNCTION

1. **Standard Form** - \_\_\_\_\_

**Key Characteristics:**

$a$  is + means the parabola opens UP/ $a$  is - means the parabola opens DOWN

\_\_\_\_\_

2. **Factored Form** - \_\_\_\_\_

**Key Characteristics:**

$a$  is + means the parabola opens UP/ $a$  is - means the parabola opens DOWN

\_\_\_\_\_

3. **Vertex Form** - \_\_\_\_\_

**Key Characteristics:**

$a$  is + means the parabola opens UP/ $a$  is - means the parabola opens DOWN

\_\_\_\_\_