Math 20-2 Quadratic Function Properties: Part One

Given the graph of a quadratic function I can:

- find the x – intercepts
- find the y – intercept
- find the vertex
- write the equation for the axis of symmetry
- plot and identify other points on the graph using the property of symmetry
- write the domain and range

Given the equation of a quadratic function I can:

- find points to plot using a mapping diagram and/or a table of values
- find the x – intercepts
- find the y – intercept
- find the vertex
- write the equation for the axis of symmetry
- write the domain and range

I can use the regression feature on my calculator to find the quadratic equation for a set of data.

I can solve problems using properties of quadratic functions

- find maximum or minimum values and interpret their meaning
- find zeros for functions and interpret their meaning
- find y-values knowing x- values (use the trace feature if necessary)
- find x-values knowing y-values (use the intersect feature if necessary)

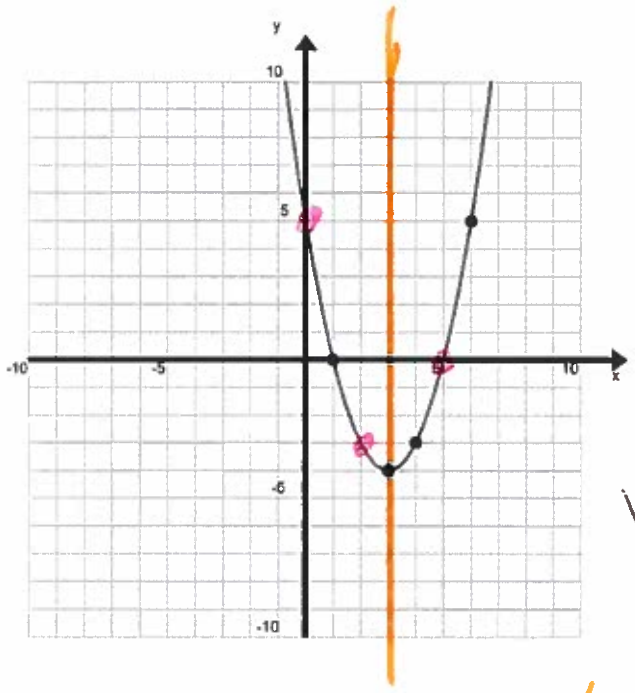
1. Given the graph of the function:
   - find the vertex
   - sketch in the axis of symmetry and write the equation for the axis of symmetry
   - plot and identify 3 other points on the graph using the property of symmetry
   - find the x – intercepts
   - find the y – intercept
   - write the domain and range

3 more points

(0, 5)

(2, -3)

(5, 0)



Vertex (3, -4)

symmetry $x = 3$

x-intercepts (1, 0) and (5, 0) OR $x = 1$, $x = 5$

y-intercept (0, 5) OR $y = 5$

Domain: all x-values, $x \in R$

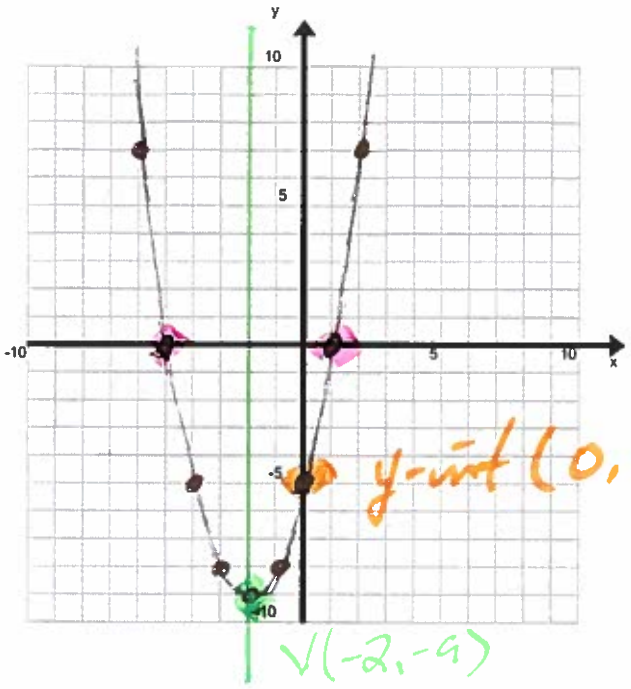
Range: smallest y-value is -4, $y \geq -4$

2. Given the equation of the quadratic function:
   - find points to plot using a mapping diagram and/or a table of values
   - find the x – intercepts
   - find the y – intercept
   - find the vertex
   - write the equation for the axis of symmetry
   - write the domain and range

$y = x^2 + 4x - 5$

X	Y
-6	7
-5	0
-4	-5
-3	-8
-2	-9
-1	-8
0	-5
1	0
2	7

$x = -2$ symmetry



x-intercepts (-5, 0) and (1, 0)

y-intercept (0, -5)

Vertex (-2, -9)

Symmetry $x = -2$

Domain: $x \in \mathbb{R}$

Range: $y \geq -9$

3. Find the quadratic equation and draw the graph for the following:

X	Y
-2	0
0	-8
1	-9
4	0

QUAD REGRESSION

$y = ax^2 + bx + c$

$a = 1$

$b = -2$

$c = -8$

$y = x^2 - 2x - 8$