4.2 Vertex Format.2020

Math 20-2

Objectives:

- **Given and equation in vertex format find the properties of the function.**
- **Write the equation of a quadratic function in vertex format.**

Skill Review: graph given $y = ax^2 + bx + c$ and graph given $y = a(x - r)(x - s)$.

Vertex 1. Given standard format: $y = x^2 + 2x - 8$. – calculate "minimum"

Vertex 2. Given factored format: $y = (x + 4)(x - 2)$. → zeros, middle (sym), vertex

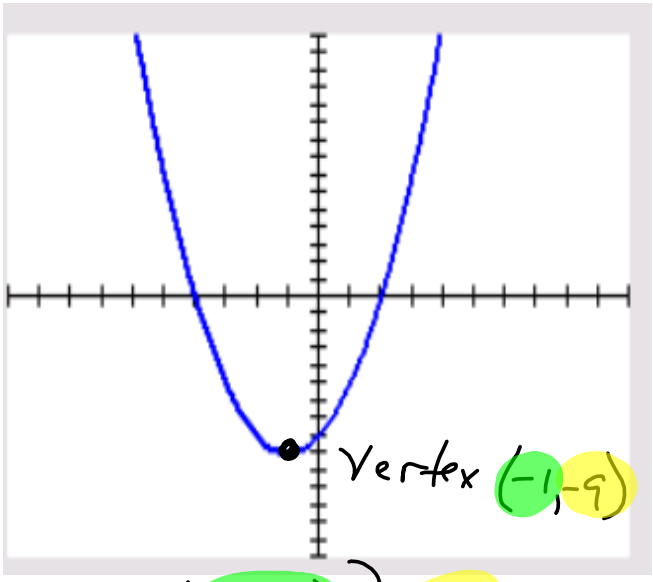
3. Given vertex format: $y = (x + 1)^2 - 9$.

a) Find at least 5 points to plot.

b) Graph.

c) Find properties: coordinates of the vertex, equation for axis of symmetry, intercepts (both x and y) and the domain & range.

X	Y1	Y2	Y3
-6	16	16	16
-5	7	7	7
-4	0	0	0
-3	-5	-5	-5
-2	-8	-8	-8
-1	-9	-9	-9
0	-8	-8	-8
1	-5	-5	-5
2	0	0	0
3	7	7	7
4	16	16	16



vertex format $y = (x+1)^2 - 9$

$x + 1 = 0$

$x = -1$

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4. Given the following quadratic functions

- Identify the vertex, write the coordinates for the point.
- Plot the vertex, draw in the line of symmetry.
- Find and plot the intercepts.
- Sketch the function.

a) $y = (x-3)^2 - 1$

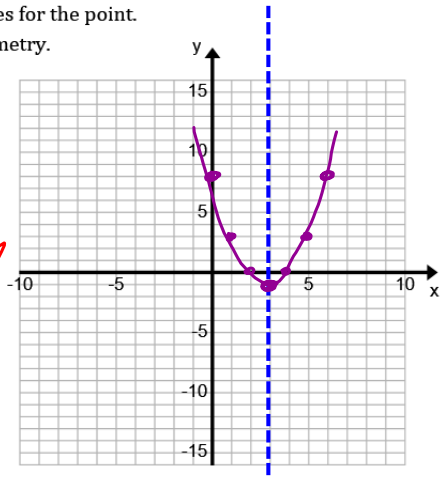
X	Y
0	8
1	3
2	0
3	-1
4	0
5	3
6	8

$x-3=0$

$x=3$

symmetry

$V(3,-1)$



b) $y = (x+6)^2 - 4$

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

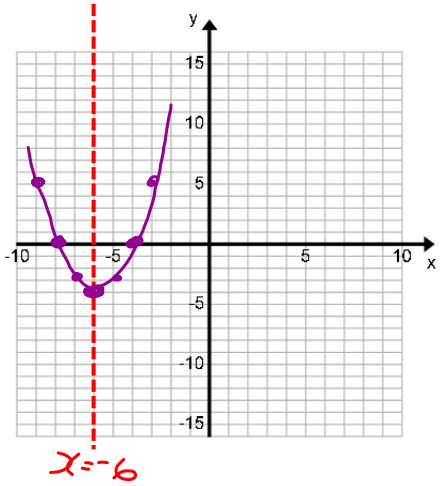
$x+6=0$

$x=-6$

symmetry

vertex

$(-6,-4)$



5. Identify the coordinates of the vertex for each function:

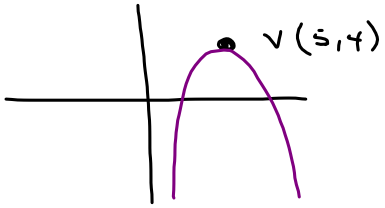
a) $y = -(x-5)^2 + 4$

$x-5=0$

$x=5$

symmetry

$V(5,4)$



b) $y = (x+3)^2 - 9$

$x=-3$

$V(-3,-9)$