Writing Quadratic Equations Day 1: Given a Vertex & a Point Name: Key Hr:____

Write an equation for a quadratic function given the following information. (in vertex form?)

1. Vertex: (2, 3) and a point (4, 5)

$5 = a(4-2)^2 + 3$

$5 = 4a + 3$

$\frac{2}{4} = \frac{4a}{4}$ $a = \frac{1}{2}$

$y = \frac{1}{2}(x-2)^2 + 3$

2. Vertex: (-5, -1) and a point (-6, 2)

$2 = a(-6+5)^2 - 1$

$2 = a - 1$

$+1 \quad +1$

$3 = a$

$y = 3(x+5)^2 - 1$

3. Vertex: (2, -3) and y-intercept of -2

$-2 = a(0-2)^2 - 3$

$-2 = 4a - 3$

$\frac{1}{4} = \frac{4a}{4}$ $a = \frac{1}{4}$

$y = \frac{1}{4}(x-2)^2 - 3$

Write an equation for a quadratic function given the following information. Then sketch a graph. (in vertex form?)

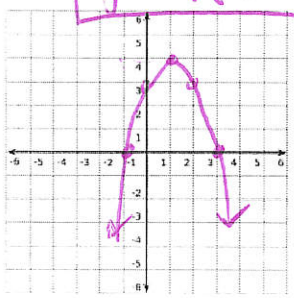
4. Vertex: (1, 4) and a point (2, 3)

$3 = a(2-1)^2 + 4$

$3 = a + 4$ $a = -1$

-4

$y = -1(x-1)^2 + 4$



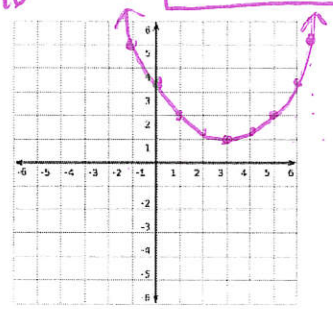
5. Vertex: (3, 1) and a point (-1, 5)

$5 = a(-1-3)^2 + 1$

$5 = 16a + 1$

$\frac{4}{16} = \frac{16a}{16}$ $a = \frac{1}{4}$

$y = \frac{1}{4}(x-3)^2 + 1$



6. Vertex: (1, 5) and a point (-1, -3)

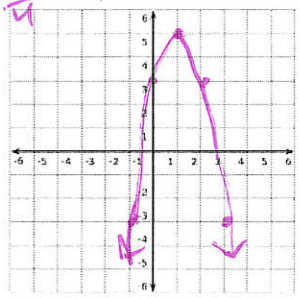
$-3 = a(-1-1)^2 + 5$

$-3 = 4a + 5$

$-5 \quad -5$

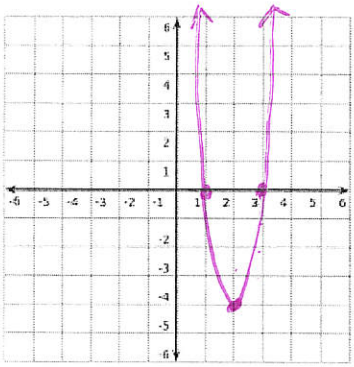
$\frac{-8}{4} = \frac{4a}{4}$ $a = -2$

$y = -2(x-1)^2 + 5$



7. Use the information provided to find the following:

Vertex: (2, -4) and x-intercept of 1 (1, 0)



A) The equation for the quadratic function.

$y = 4(x-2)^2 - 4$

$0 = a(1-2)^2 - 4$

$0 = a - 4$

$a = 4$

B) Sketch a graph.

C) State the domain and range

D: $(-\infty, \infty)$ R: $[-4, \infty)$

D) Determine if there is a max or min

min at -4

E) Find f(1)

0

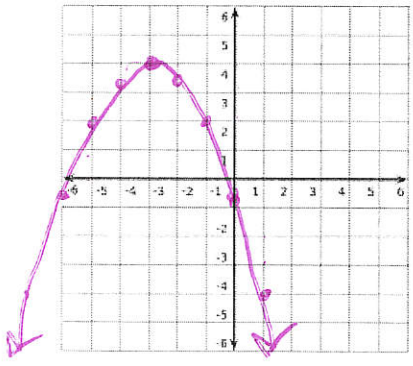
$f(1) = 4(1-2)^2 - 4$

$= 4(-1)^2 - 4 = 4(1) - 4 = 4 - 4$

$= 0$

8. Use the information provided to find the following:

Vertex: (-3, 4) and a point (1, -4)



A) The equation for the quadratic function.

$y = -\frac{1}{2}(x+3)^2 + 4$

$-4 = a(1+3)^2 + 4$

$-4 = 16a + 4$

$-4 \quad -4$

$\frac{-8}{16} = \frac{16a}{16}$ $a = -\frac{1}{2}$

B) Sketch a graph.

C) State the domain and range

D: $(-\infty, \infty)$ R: $(-\infty, 4]$

D) Determine if there is a max or min

max at 4

E) Find f(-5)

2

$f(-5) = -\frac{1}{2}(-5+3)^2 + 4$

$-\frac{1}{2}(4) + 4 = -2 + 4 = 2$