1. Complete the table if needed, plot the points and sketch the curve for $f(x) = x^2$
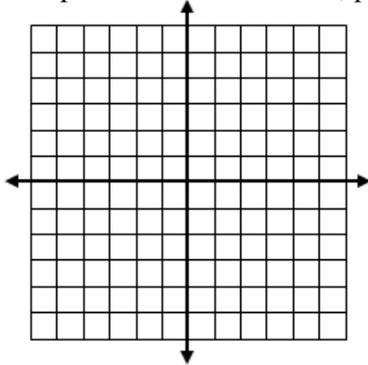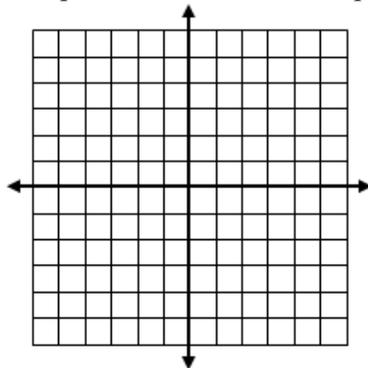
Vertex: _____

Min or Max: _____

Domain: _____

Range: _____

AOS: _____

2. Complete the table if needed, plot the points and sketch curve for $k(x) = 2(x+1)^2 - 4$

Vertex: _____

Min or Max: _____

Domain: _____

Range: _____

AOS: _____

a. Is $(3, 28)$ a solution of $k(x)$? How do you know?

b. Compare the graph of $k(x) = 2(x+1)^2 - 4$ to $f(x) = x^2$. Which one is wider? How do you know?

c. The 1 and the 4 changed the location of the vertex. What did the 1 do to the graph? What did the 4 do to the graph?

d. Name two other points that are solutions to $k(x)$. (____ , ____) and (____ , ____)

e. Xai did the following work to find the x-intercepts.

$0 = 2(x+1)^2 - 4$

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

$2 = (x+1)^2$
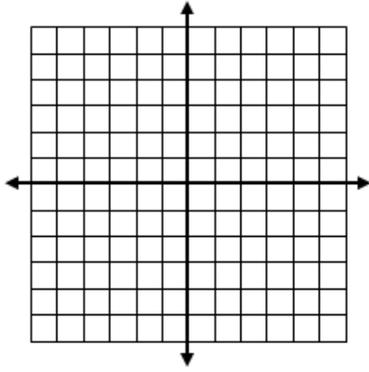
$\sqrt{2} = \sqrt{(x+1)^2}$

$\sqrt{2} = x + 1$

$x = \sqrt{2} - 1$

$x = 1.414 - 1$

$x = 0.414$

> Xai concluded that there should be one x-intercept at $(0.414, 0)$. The graph shows two x-intercept. Help Xai understand what is wrong.

3. Complete the table if needed, plot the points and sketch curve for $t(x) = -\frac{1}{2}(x-3)^2 + 2$

Vertex: _____
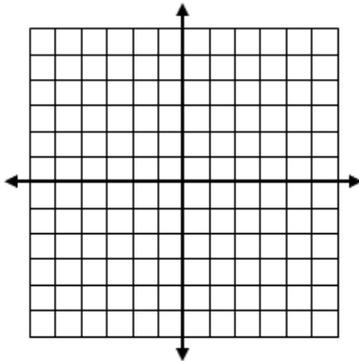
Min or Max: _____

Domain: _____

Range: _____

AOS: _____

a. How did changing the "a" value to $-\frac{1}{2}$ change the shape of the parabola $y = x^2$?

b. What are the zeros (x-intercepts) of the function?

c. Is $(0,1)$ a solution to $t(x)$? How do you know?
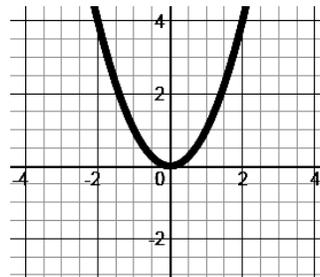
[d-f] Recall the equation: $f(x) = a(x-h)^2 + k$

c. How does "a" affect the shape of the graph?

d. How does "h" affect the graph?

e. How does "k" affect the graph?

4. Graph $g(x) = \frac{1}{4}(x-2)^2 - 4$

a. Vertex: _____

b. $g(x)$ opens up or down: _____

c. g(x) is narrow, wide or the same shape as $f(x) = x^2$? _____

d. Axis of Symmetry: _____

e. x intercepts: (____, ____) and (____, ____)

f. y intercept: (____, ____)

5. Given the graph of $f(x) = x^2$, graph $g(x) = (x-3)^2 + 1$ on the same grid.

a. Choose the transformation that maps $f(x)$ onto $g(x)$: _____

A. Translate left 3 and up 1 or $(x, y) \rightarrow (x-3, \ y+1)$

B. Translate left 3 and down 1 or $(x, y) \rightarrow (x-3, \ y-1)$

C. Translate right 3 and up 1 or $(x, y) \rightarrow (x+3, \ y+1)$

D. Translate right 3 and down 1 or $(x, y) \rightarrow (x+3, \ y-1)$

6. The graph represents $f(x)$ and the table shows some values of another quadratic function $g(x)$. Select whether each statement is **True** or **False** about the given functions.
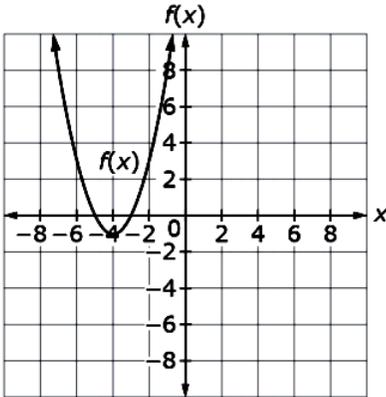
x	-4	-3	-2	-1	0	1	2	3	4	5	6
g(x)	0	-9	-16	-21	-24	-25	-24	-21	-16	-9	0

Statement	True	False
6a. The minimum value of $f(x)$ is greater than the minimum value of $g(x)$.		
6b. The value of x when $f(x)$ is at its minimum is less than the value of x when $g(x)$ is at its minimum.		
6c. Both x intercepts of $g(x)$ occur when x is greater than zero.		
6d. The axis of symmetry of $f(x)$ is $x = 1$.		

7. The graph of $h(t) = -16\left(x - \frac{1}{2}\right)^2 + 36$ models the path of a rocket's height, h, with respect to time, t.
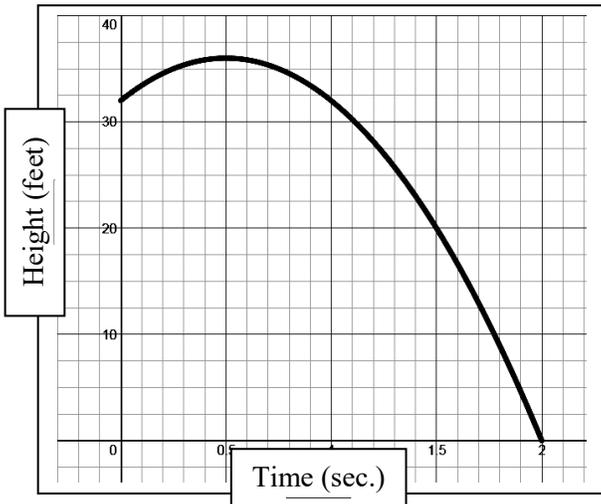
Choose True or False:

Statement	True	False
7a. The maximum height of the rocket Is at 36 feet.		
7b. The maximum height is 2 feet.		
7c. It took 2 seconds for the rocket to hit the ground.		
7d. The rocket started at an initial height of 30 feet.		
7e. The rocket was increasing in height between time 0 and time 0.5 sec.		

7f.
   Vertex: _____

7g. Is it more useful to look at the equation of a graph if you need a precise answer? Explain using a complete sentence.