III. Quiz review

16. Describe the transformations from the function $f(x) = x^2$ and identify the vertex for $g(x) = -3(x-4)^2 + 2$.

Reflect over the x-axis, vertical stretch by a factor of 3, right 4, up 2

VERTEX: (4, 2)

17. Describe the transformations from the function $f(x) = x^2$ and identify the vertex for $h(x) = \frac{1}{4}(x+1)^2 - 8$.

Vertical compression by a factor of 1/4, left 1, down 8

VERTEX: (-1, -8)

18. Use the table below to complete the following information.

x	f(x)	1st	2nd
3	-6	10	-4
4	0	6	-4
5	2	2	-4
6	0	-2	-4
7	-6	-6	-4

A. Vertex (5, 2) B. (Maximum) or Minimum C. Axis of Symmetry $x = 5$

D. Second Difference -4 E. y-intercept (0, -48) F. # of x-intercepts 2

G. Vertex Form $f(x) = -2(x-5)^2 + 2$

H. Describe the transformations from the parent function $f(x) = x^2$.

Reflect over the x-axis, vertical stretch by a factor of 2, Right 5, up 2

I. Standard Form $f(x) = -2x^2 + 20x - 48$ (show all work)

$f(x) = -2(x-5)(x-5) + 2$

$= -2(x^2 - 10x + 25) + 2$

$= -2x^2 + 20x - 50 + 2$

$= -2x^2 + 20x - 48$

or

$f(x) = -2x^2 + Bx - 48 \Rightarrow f(x) = -2x^2 + 20x - 48$

$0 = -2(4)^2 + B(4) - 48$

$0 = -32 + 4B - 48$

$80 = 4B$

$0 = -80 + 4B \rightarrow B = 20$

19. Use the transformations from the parent function $f(x) = x^2$ to complete the following information.

$h(x)$ was translated left 2 units, vertically compressed by a scale factor of $\frac{1}{2}$, and translated down 6 units.

A. Vertex (-2, -6) B. Maximum or (Minimum) C. Axis of Symmetry $x = -2$

D. Second Difference 1 E. y-intercept (0, -4) F. # of x-intercepts 2

G. Vertex Form $f(x) = \frac{1}{2}(x+2)^2 - 6$

H. Standard Form $f(x) = \frac{1}{2}x^2 + 2x - 4$ (show all work)

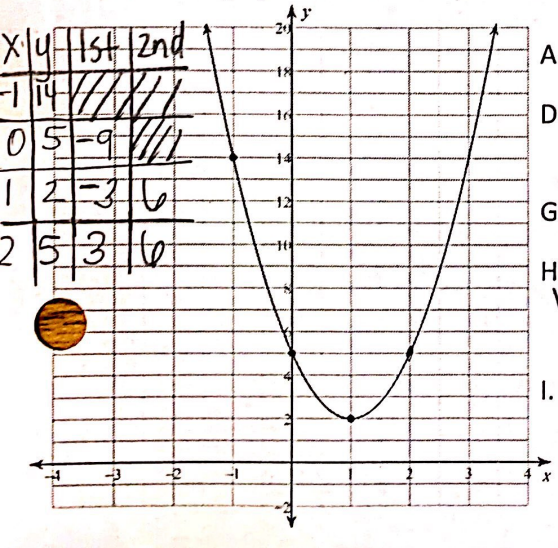
$f(x) = \frac{1}{2}(x+2)(x+2) - 6$

$= \frac{1}{2}(x^2 + 4x + 4) - 6$

$= \frac{1}{2}x^2 + 2x + 2 - 6$

$= \frac{1}{2}x^2 + 2x - 4$

20. Use the graph below to complete the following information.



x	y	1st	2nd
-1	14	///	///
0	5	-9	///
1	2	-3	6
2	5	3	6

A. Vertex (1, 2) B. Maximum or (Minimum) C. Axis of Symmetry $x = 1$

D. Second Difference 6 E. y-intercept (0, 5) F. # of x-intercepts none

G. Vertex Form $f(x) = 3(x-1)^2 + 2$

H. Describe the transformations from the parent function $f(x) = x^2$.

Vertical stretch by a factor of 3, Right 1, up 2

I. Standard Form $f(x) = 3x^2 - 6x + 5$ (show all work)

$f(x) = 3(x-1)(x-1) + 2$

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

$= 3x^2 - 6x + 3 + 2$

$= 3x^2 - 6x + 5$

$f(x) = 3x^2 + Bx + 5$

$2 = 3(1)^2 + B(1) + 5$

$2 = 3 + B + 5$

$2 = 8 + B \Rightarrow B = -6$