First name: _____ Last name: _____ Student ID: _____

Quadratic Function (2) Homework

1. Complete the table.

Relation	|a|	Direction of Opening	Stretch/Compress	Shape compare to $y = x^2$ (Wider/Narrower)
$y = 5x^2$				
$y = -\frac{1}{2}x^2$				
$y = 0.25x^2$				
		Up	Stretch by a factor of 8	
	0.9	Down		

2. Complete the table.

Relation	h	k	Left/right	Up/down
$y = x^2$	0	0	N/A	N/A
$y = (x - 4)^2 + 1$				
			Left 3	Down 5
	-2	6		

3. Complete the table.

Relation	Stretch/compression factor?	Reflection in the x-axis? (Yes/No)	Any translations?
$y = 4(x + 7)^2 - 3$			
$y = -(x - 1)^2 + 4$			
	½	No	Right 11 units, Up 1 unit
$y = -9x^2 - 5$			
$y = 0.8(x - 6)^2$			

4. Sketch the graph of each of the following using transformation. **Please work on a graph paper. Use a separate grid for each equation.**

i) Describe the transformations you would apply to the graph of $y = x^2$ in order.
Recall that the order is: 1) stretch/compress – "\|a\|" 2) reflection 3) translation – "h" and "k"
ii) Sketch the graph from the original graph $y = x^2$ with all transformations in above order.
iii) Identify the vertex in each graph.

a) $y = (x - 4)^2$ b) $y = x^2 + 2$ c) $y = (x + 5)^2 - 4$ d) $y = (x - 3)^2 + 1$

e) $y = 3x^2$ f) $y = -\frac{1}{3}x^2$ g) $y = 2(x - 3)^2$ h) $y = -3x^2 - 2$

i) $y = -5(x - 2)^2$ j) $y = -\frac{1}{2}x^2 - \frac{3}{2}$ k) $y = 2(x + 4)^2 - 7$ l) $y = -3(x - 1)^2 + 16$

m) $y = \frac{1}{2}(x - 2)^2 - 5$ n) $y = -1.5(x + 3)^2 + 10$

5. The following transformations are applied to a parabola with the equation $y = x^2$. Determine the values of a, h, and k, and write the equation in the form $y = a(x - h)^2 + k$.

a) The parabola moves 3 units right.

b) The parabola moves 4 units down.

c) The parabola moves 2 units left.

d) The parabola moves 7 units down and 6 units left.

e) The parabola moves 2 units right and 5 units up.

f) The parabola is reflected about the x-axis and then translated 9 units up.

g) The parabola is stretched vertically by a factor of 5 and then translated 6 units left.

h) The parabola is compressed vertically by a factor of 1/5, reflected about the x-axis, translated 8 units right, and translated 1 unit down.

6. When a graph of $y = x^2$ is transformed, the point (3, 9) moves to (8, 17). Find an equation of the new parabola.