MATH 100 Class Work on Graphing Quadratic Functions

Example 1: Describe the graph of the function $y = 2(x - 2)^2 - 18$.

Example 2: Describe the graph of $y = a(x - h)^2 + k$.

Example 3: Consider the quadratic function defined by $y = 2x^2 - 8x - 10$.

We could have defined the function by $y = 2(x + 1)(x - 5)$.

Complete the table below. Sketch a graph in the space to the right of the table.

Δx	x	y	Δy	$\Delta\Delta y$
	-4			
	-3			
	-2			
	-1			
	0			
	1			
	2			
	3			
	4			
	5			
	6			
	7			
	8			

Describe the graph of the function in Example 3.

Example 4: Consider the general quadratic $y = ax^2 + bx + c$.

Complete the table below and comment on any interesting patterns.

Δx	x	y	Δy	ΔΔy
	0			
	1			
	2			
	3			
	4			
	5			

Complete the algebraic manipulations below.

$y = a(x - h)^2 + k$

$y = a(x^2 - \_\_\_\_\_ + h^2) + k$

$y = ax^2 - \_\_\_\_\_ + \_\_\_\_\_ + k$

$y = ax^2 + (\_\_\_\_\_)x + (\_\_\_\_\_ + k)$

So,

b = _____. Hence h = _____.

c = _____. Hence k = _____.

Now, describe the graph of the general quadratic $y = ax^2 + bx + c$