MATH 160 Session #6

Given a quadratic function of the form $f(x) = a(x - h)^2 + k$, the graph of f is a

_____ that opens _____ if $a > 0$, opens _____ if $a < 0$ and has its

vertex at the point (____ , ____).

How can we describe the location and orientation of a quadratic function of the form $f(x) = ax^2 + bx + c$?

Let's do some algebra.

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

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

$= ax^2 + \_\_\_\_\_x + [\_\_\_\_ + k]$

In this instance,

b = _____ . Solving for h we obtain h = _____.

c = _____ . Solving for k we obtain k = _____ .

In conclusion, a quadratic function of the form $f(x) = ax^2 + bx + c$ has a graph in the shape of a _____ that opens _____ if $a > 0$, opens _____ if $a < 0$, and has its vertex at the point (_____ , _____).

For example, here is a sketch of the graph of $f(x) = -2x^2 + 12x - 3$.