Exploring Quadratic Mappings

These are my conclusions

A quadratic function is usually written in the form of $f(x) = ax^2 + bx + c$
I applied various values to x and a,b,c remained constant. Then I put the results on an x,y table and then plotted them on a graph.

A)I found that as a quadratic graph always has x^2 it will be a **curved** graph and will have a parabola. The parabola will open upwards if a is more than 0 and will open downwards when the value of a is less than 0.
Each parabola is **symmetrical** because it is ax^2 –when numbers are squared as below you get a symmetrical pattern and when they are plotted on a graph you get a parabola.

X	-4	-3	-2	-1	0	1	2	3	4
Y	16	9	4	1	0	1	4	9	16

You can also find the exact **axis of symmetry** by **x= -b/2a**. This will give you the x coordinate of the axis of symmetry.

B)From a quadratic mapping you can tell a graph will **cross** the x axis always when y =0
And you can tell the graph will cross the y axis when x is 0 or c. But a quadratic function can have one, two or no x intercepts.

C)The **vertex** is the lowest point or the highest point of the graph depending upon whether the parabola is upwards or downwards. If x^2 is positive then the vertex is the lowest point and if x^2 is negative then it is the highest point of the graph. You can tell the points of the vertex from the mapping as they are the lowest part- eg
For the $f(x)= 2x^2 -4x +5$

X	-2	-1	0	1	2
F(x)	21	11	5	3	5

Here the vertex coordinates are 1,3.
You can also tell the points of a vertex if you know the axis of symmetry.
So for a function $f(x)= 2x^2 -4x +5$ the axis of symmetry is x=-b/2a and here it is 4/2x2=1 which is the "x" coordinate.
The "y"coordinate is $f(x^2)= +bx + c =y$. So here it is $2(1^2) +-4(1) + 5 =3$
So the lowest point of the vertex are the coordinates (1,3)