PC 11

Quadratic Function – Review I

1. Fill in the blanks:

a) Every equation of a quadratic function has to contain term of the form _____ and the exponent of _____ has to be the greatest exponent if the equation.

b) The graph of every quadratic function is called _____ .

c) Every graph of a quadratic function has the following features:

- _____
- _____of symmetry with the equation of the form:_____ .
- _____ - intercept of the form: _____ .
- End behaviour of two possible types: opens _____ or opens _____

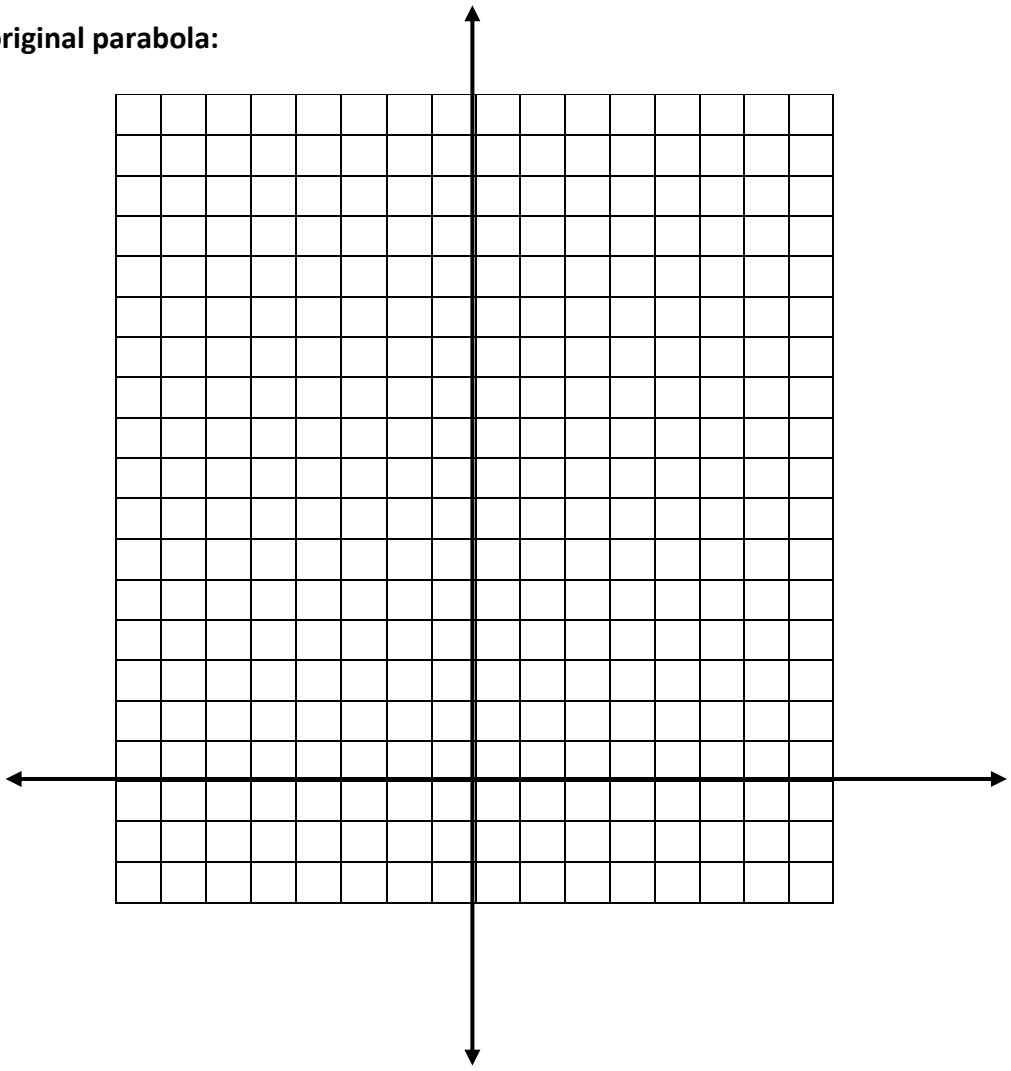
d) Every graph of a quadratic function has at most _____ x-intercepts. Some graphs have _____ x-intercept and some have _____ x- intercept.

e) The original graph of a quadratic function has the equation: _____ and contains these seven points:

f) The original graph of a quadratic function can undergo several types of transformations:

- _____ in _____ -axis will result in a graph that opens _____
- _____ translation (_____) will result in a graph that has a vertex moved either to the _____ or to the _____ .
- _____translation (_____) will result in a graph that has a vertex moved either _____ or _____
- _____ stretch compression (_____) will result in a graph that is _____ than the original graph.
- _____ stretch expansion (_____) will result in a graph that is _____ than the original graph.

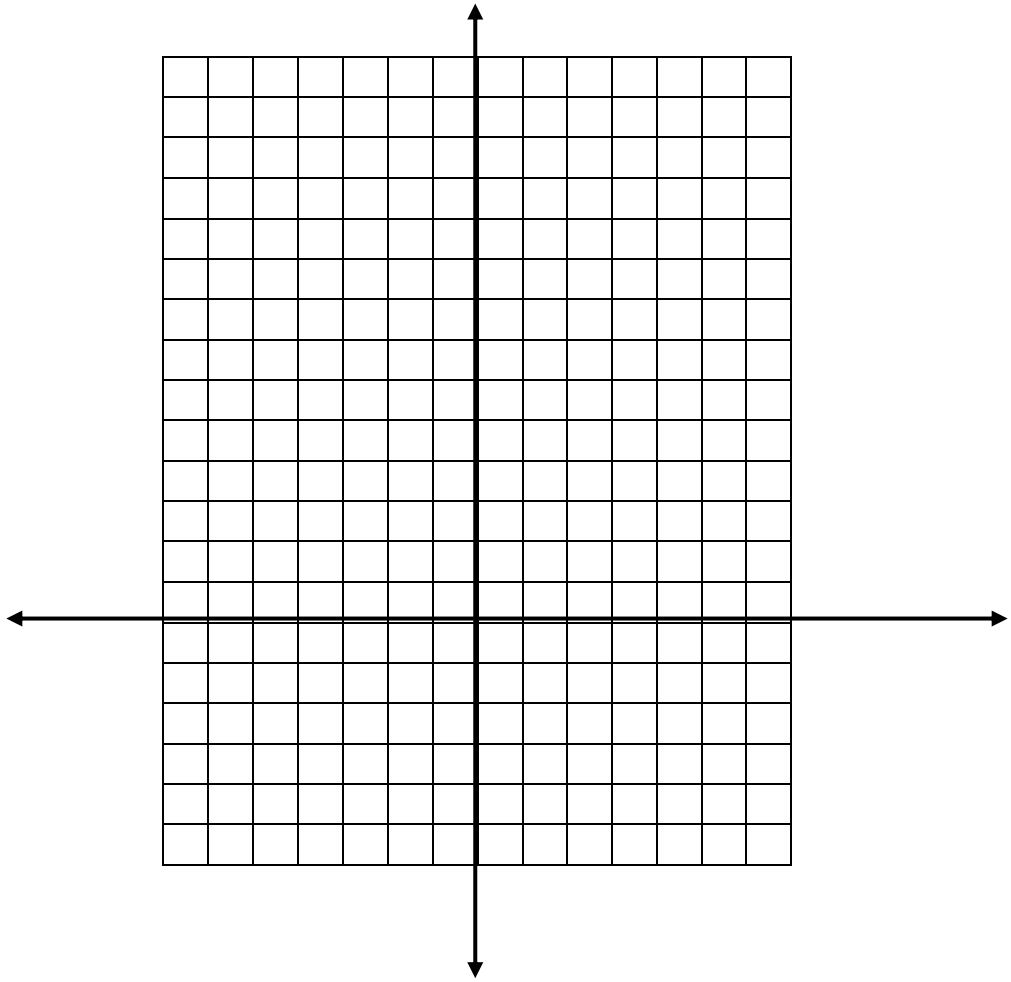
2. **Graph the original parabola:**



3. **Identify what transformations are represented by letters/symbols in the <u>vertex form</u> of the quadratic equation:**

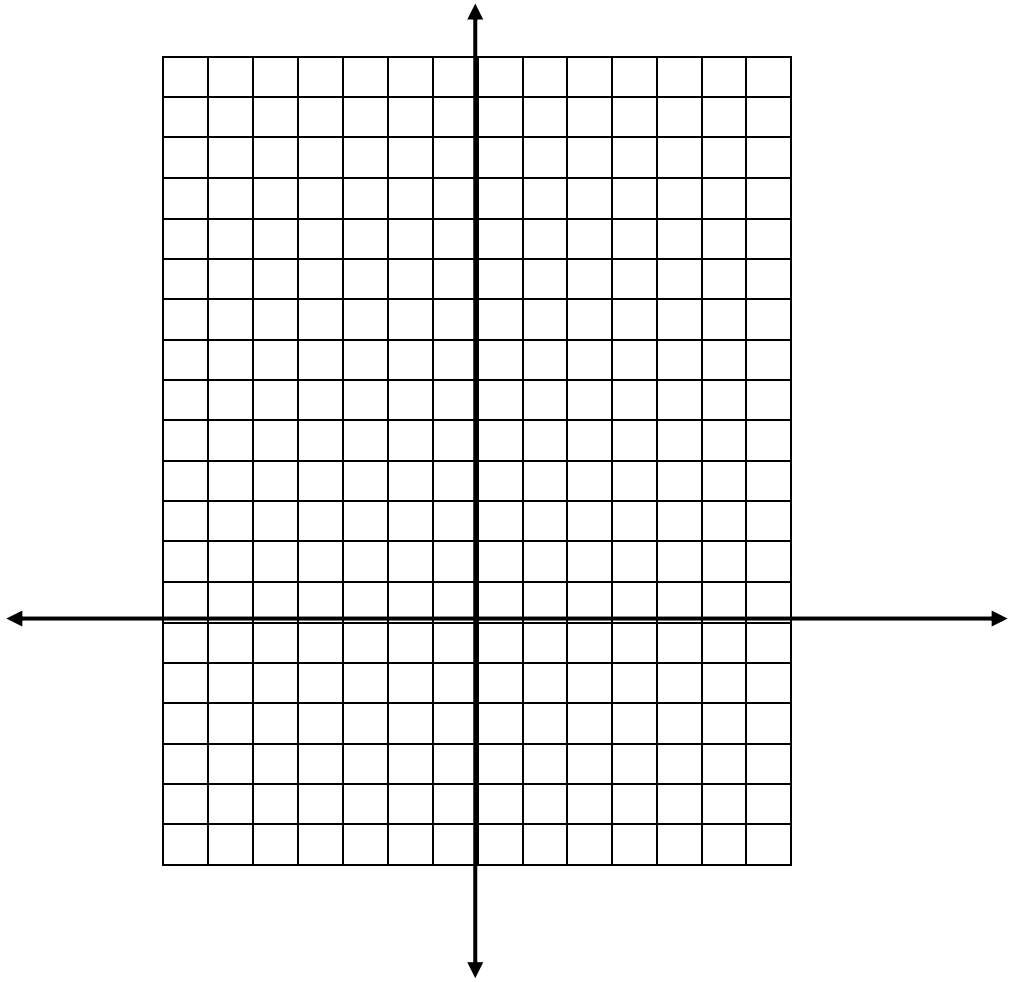
$$y = \pm a(x - h)^2 + k$$

4. **Graph $y = -x^2 + 9$ and describe the graph. At least 5 points have to be exact.**



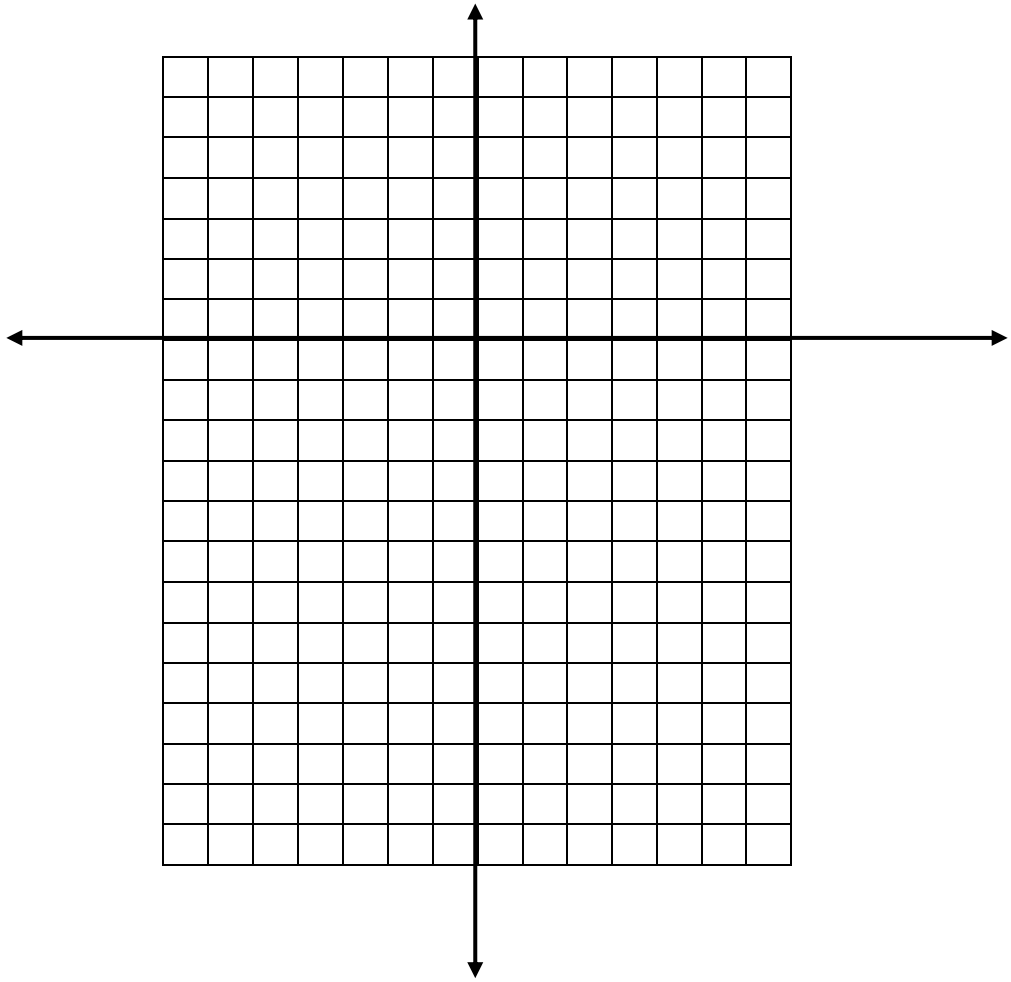
Mapping notation:		Transformations:	
Vertex:		Axis of symmetry:	
y-intercept:		End behaviour:	
x-intercept(s):		Maximum or Mininmum value:	

5. **Graph $y = (x + 3)^2 + 1$ and describe the graph. At least 5 points have to be exact.**



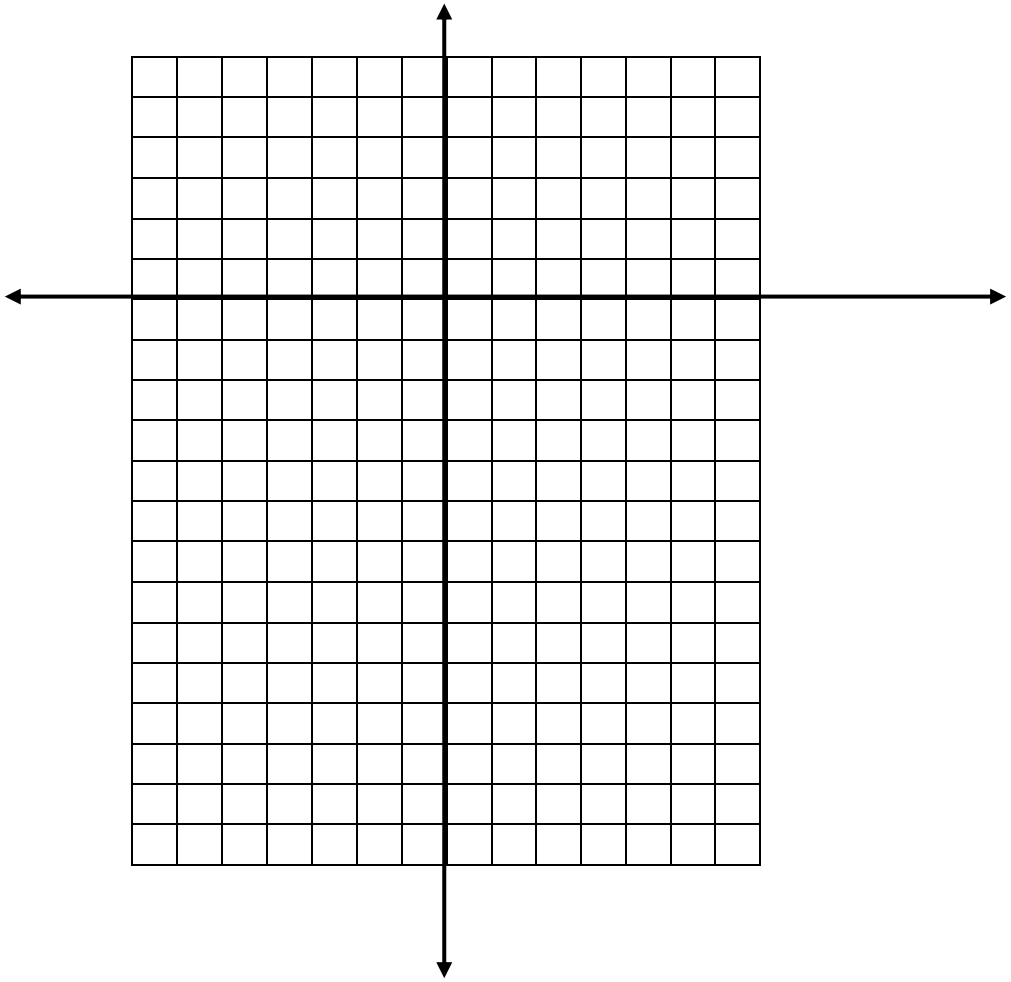
Mapping notation:		Transformations:	
Vertex:		Axis of symmetry:	
y-intercept:		End behaviour:	
x-intercept(s):		Maximum or Mininmum value:	

6. **Graph $y = -(x - 5)^2$ and describe the graph. At least 5 points have to be exact.**



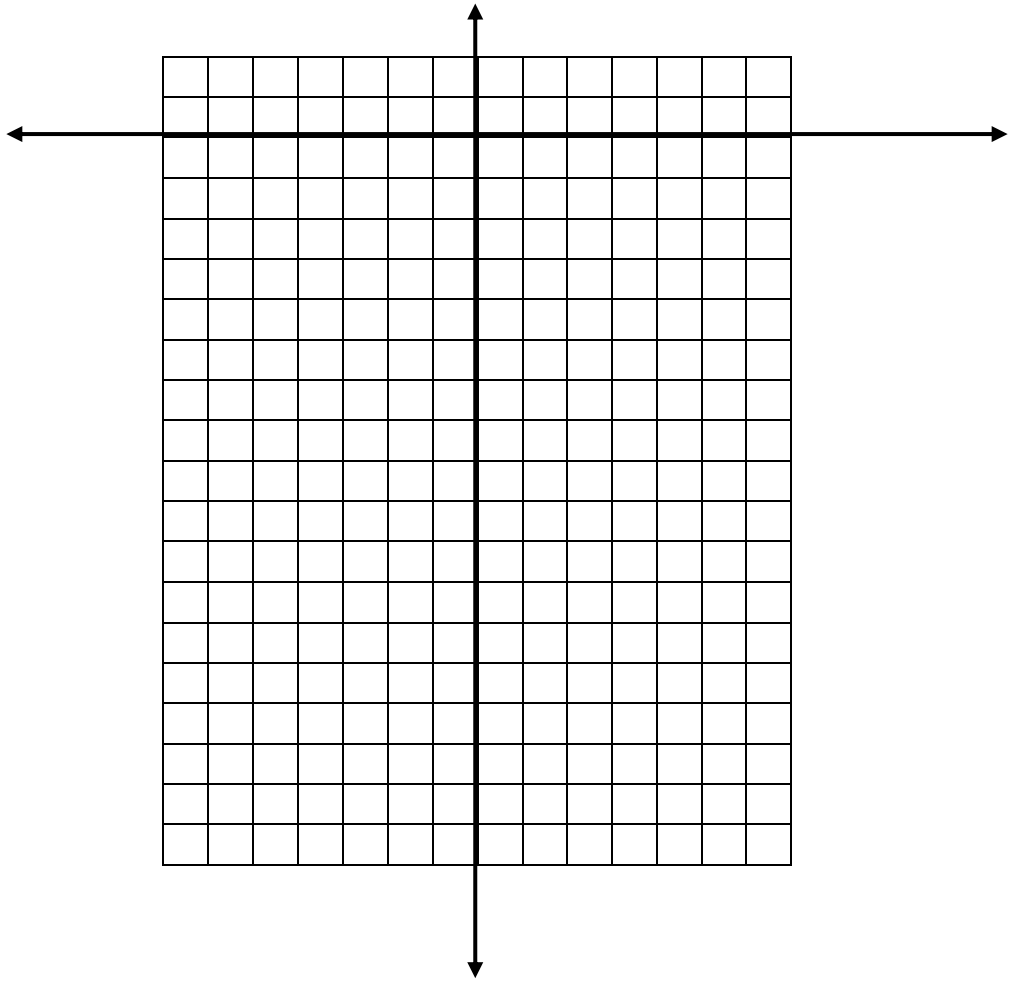
Mapping notation:		Transformations:	
Vertex:		Axis of symmetry:	
y-intercept:		End behaviour:	
x-intercept(s):		Maximum or Mininmum value:	

7. **Graph $y = -(x + 2)^2 + 4$ and describe the graph. At least 5 points have to be exact.**



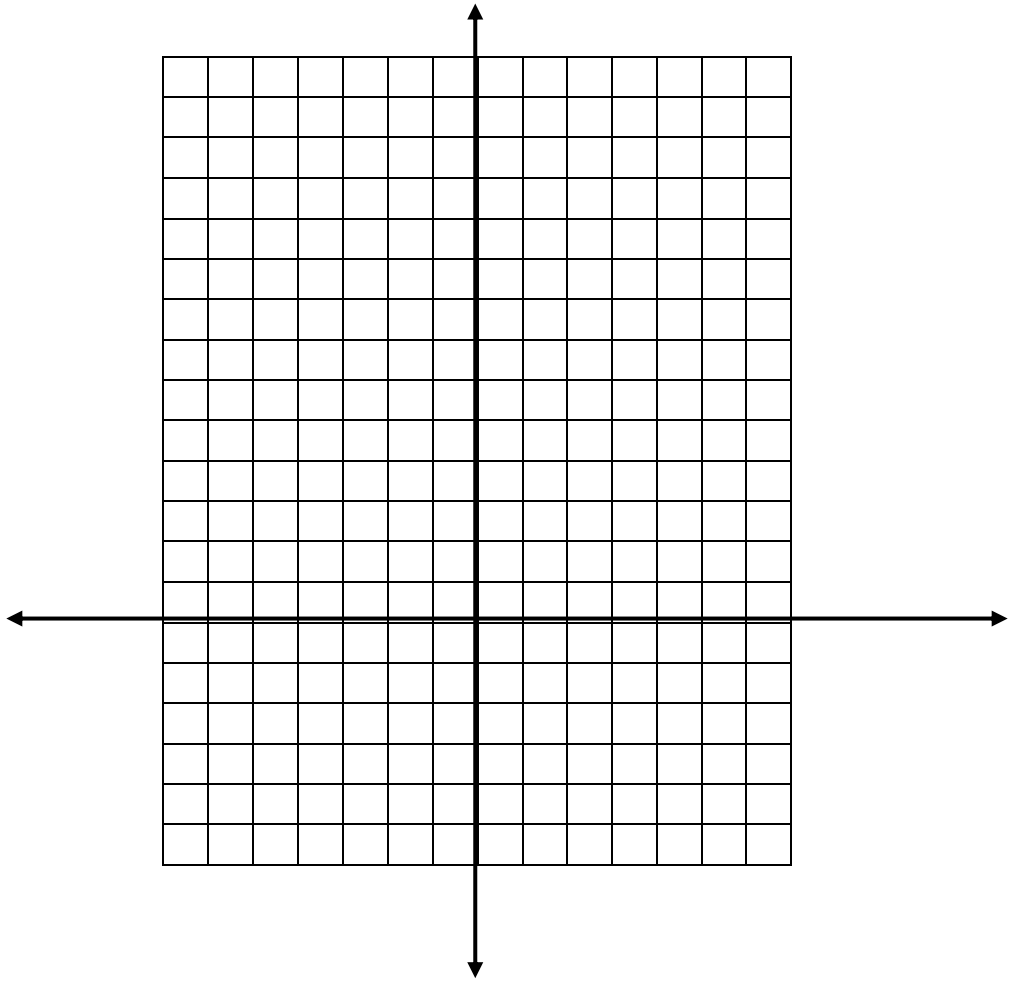
Mapping notation:		Transformations:	
Vertex:		Axis of symmetry:	
y-intercept:		End behaviour:	
x-intercept(s):		Maximum or Mininmum value:	

8. **Graph $y = -x^2 - 3$ and describe the graph. At least 5 points have to be exact.**



Mapping notation:		Transformations:	
Vertex:		Axis of symmetry:	
y-intercept:		End behaviour:	
x-intercept(s):		Maximum or Mininmum value:	

9. **Graph $y = -(x - 1)^2 + 9$ and describe the graph. At least 5 points have to be exact.**



Mapping notation:		Transformations:	
Vertex:		Axis of symmetry:	
y-intercept:		End behaviour:	
x-intercept(s):		Maximum or Mininmum value:	

10. Conclusion:

a) When the original graph undergoes a reflection in the x-axis, a y-coordinate of any point on the new graph is either _____ or _____ .

b) If the original graph undergoes a reflection in the x-axis, then the transformed graph opens _____ .

c) If the original graph undergoes a reflection in the x-axis, then the transformed graph has a maximum value. This value is the same as the _____ - coordinate of the _____ .

d) If the original graph does not undergo a reflection in the x-axis, then the graph opens _____, and has a _____value. This value is the same as the _____ - coordinate of the _____ .

e) Every graph of a quadratic function has an axis of symmetry with an equation $x = \ a\ real\ number$. This number is the same as the _____ - coordinate of the _____.

f) The value of maximum or minimum is affected by 2 transformations:

_____ and _____ .

g) _____ and _____ have no effect on the value of the minimum or maximum.