

# Quadratic Function – Review I

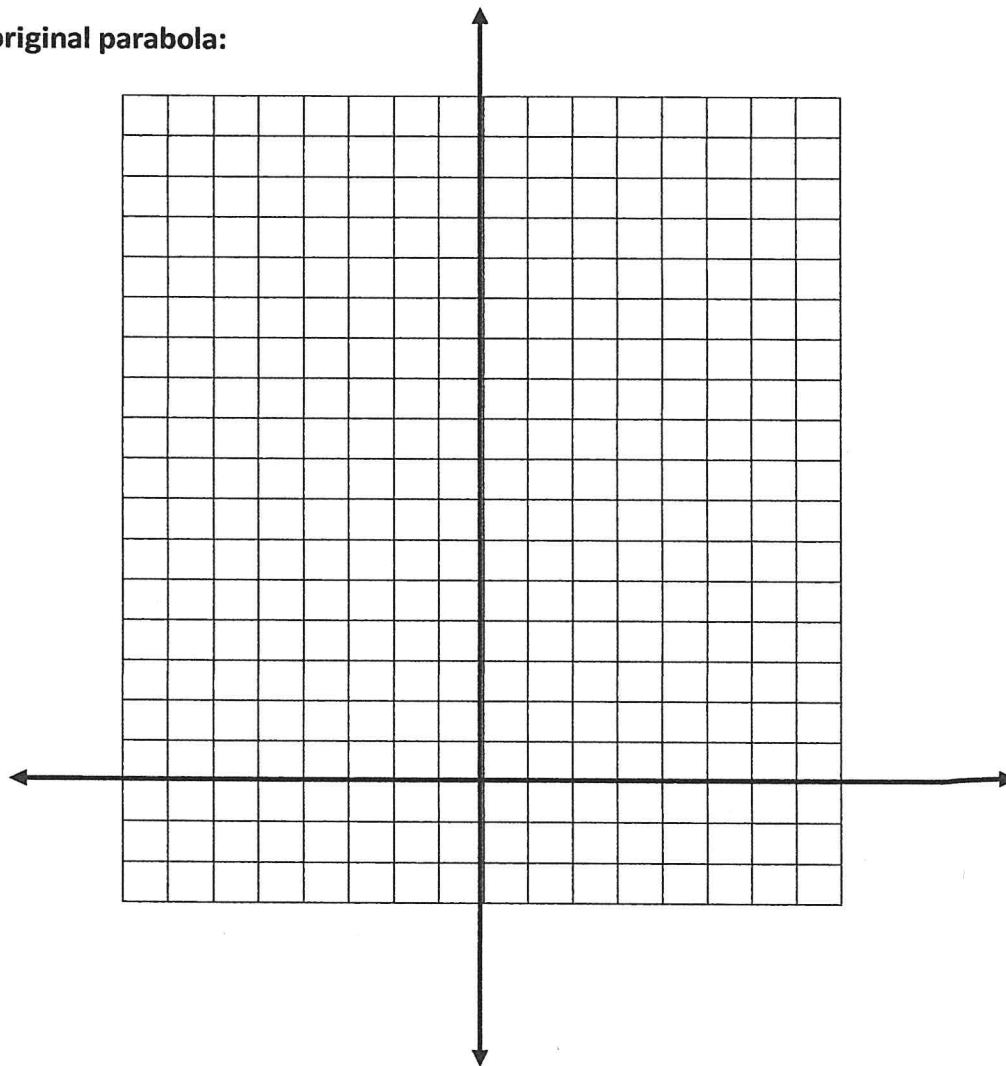
**1. Fill in the blanks:**

- 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.

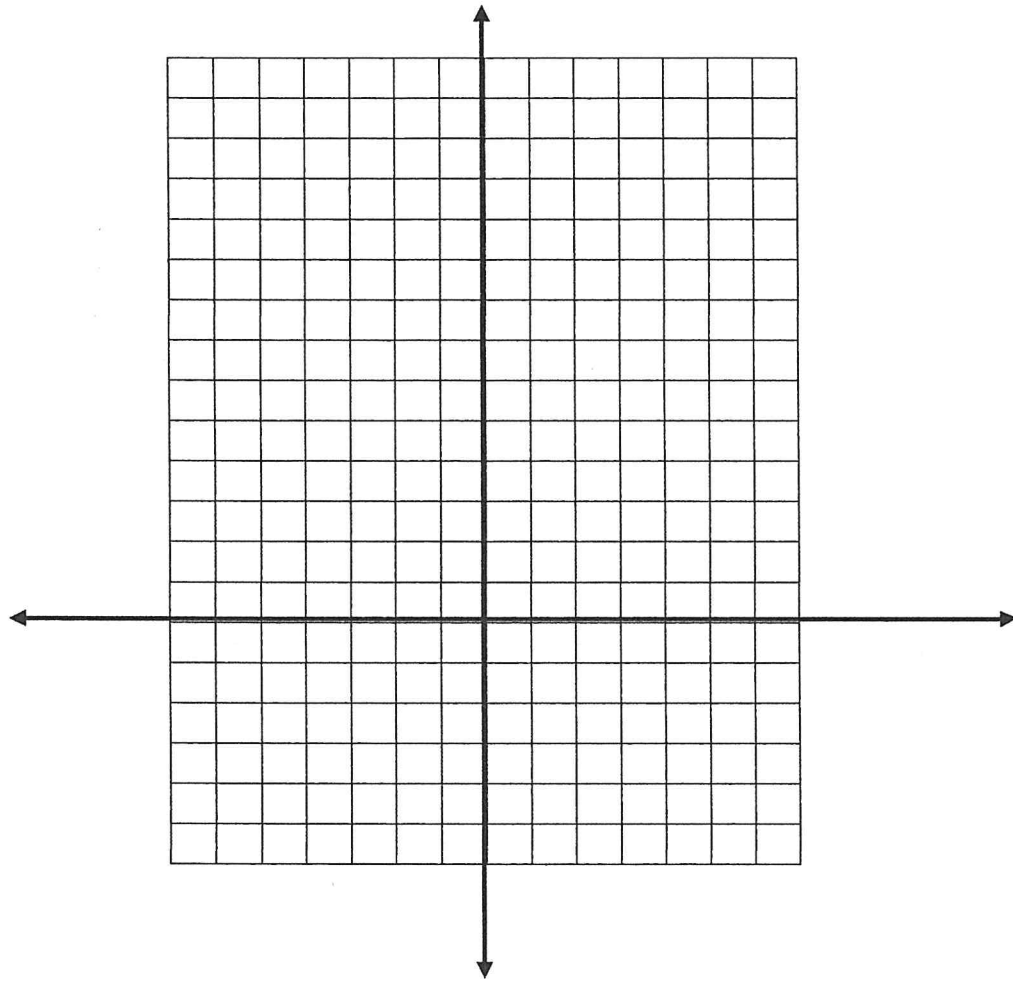
2. Graph the original parabola:



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

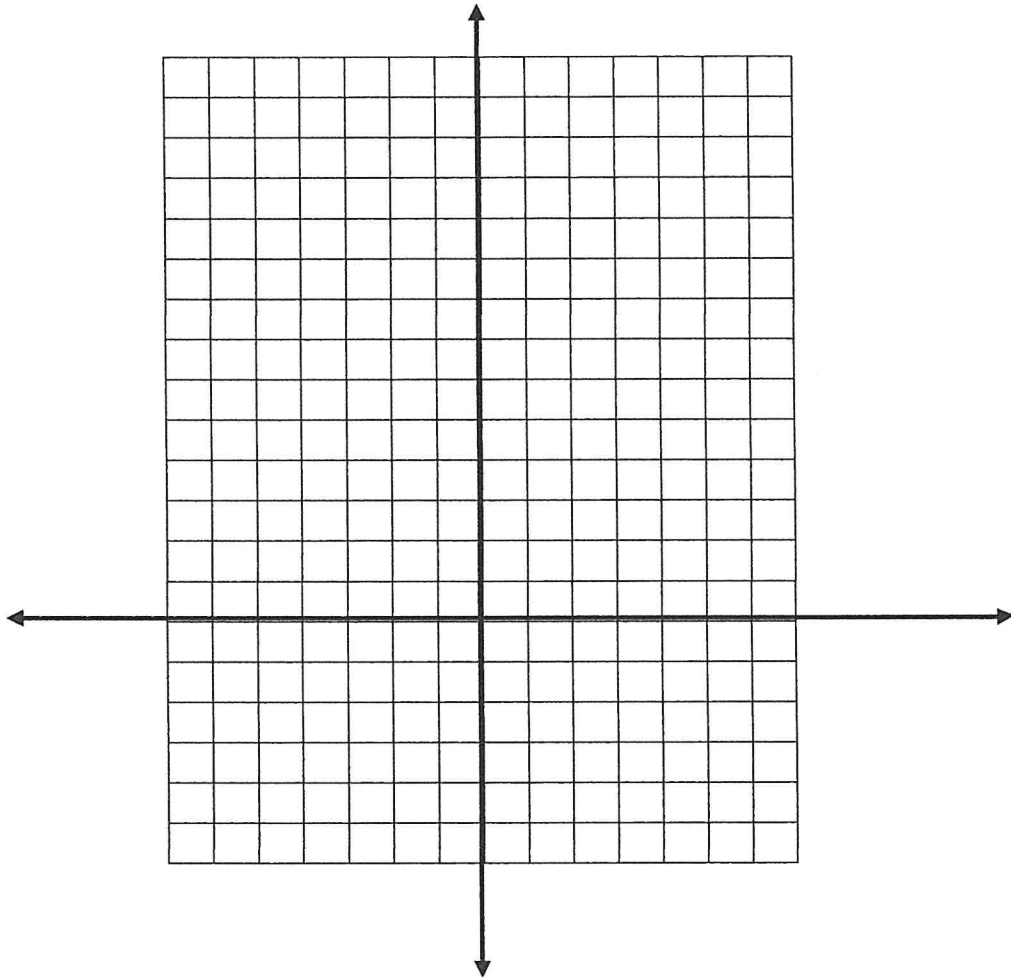
$$y = \pm a(x - h)^2 + k$$

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



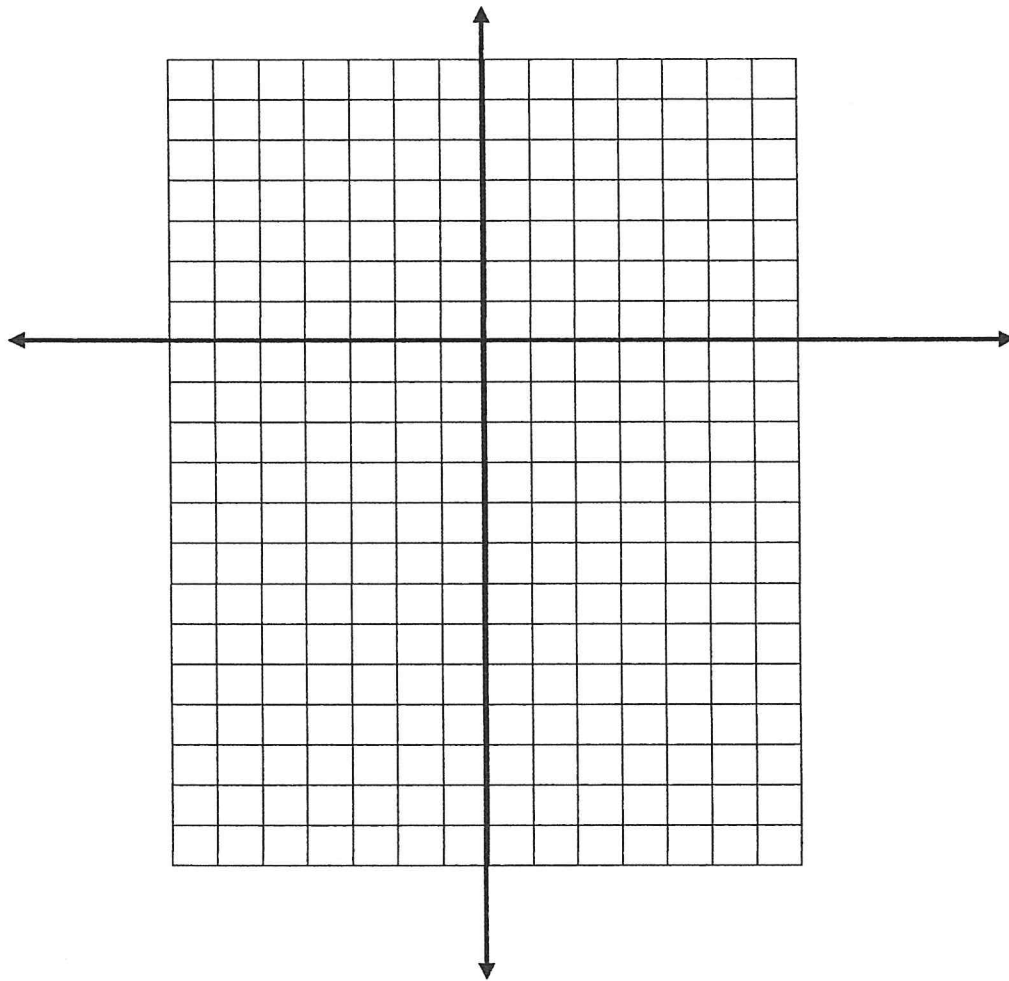
|                   |  |                           |  |
|-------------------|--|---------------------------|--|
| Mapping notation: |  | Transformations:          |  |
| Vertex:           |  | Axis of symmetry:         |  |
| y-intercept:      |  | End behaviour:            |  |
| x-intercept(s):   |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

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



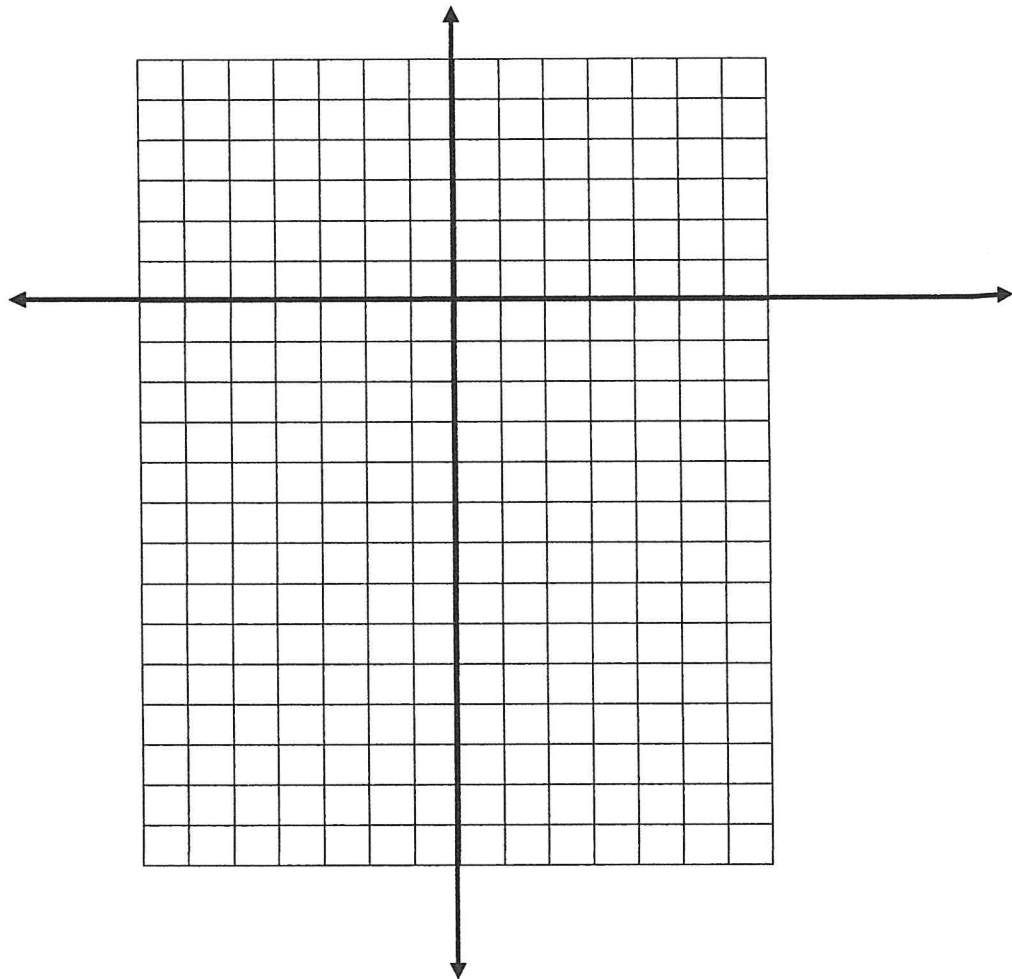
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|-------------------|--|---------------------------|--|
| Mapping notation: |  | Transformations:          |  |
| Vertex:           |  | Axis of symmetry:         |  |
| y-intercept:      |  | End behaviour:            |  |
| x-intercept(s):   |  |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

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



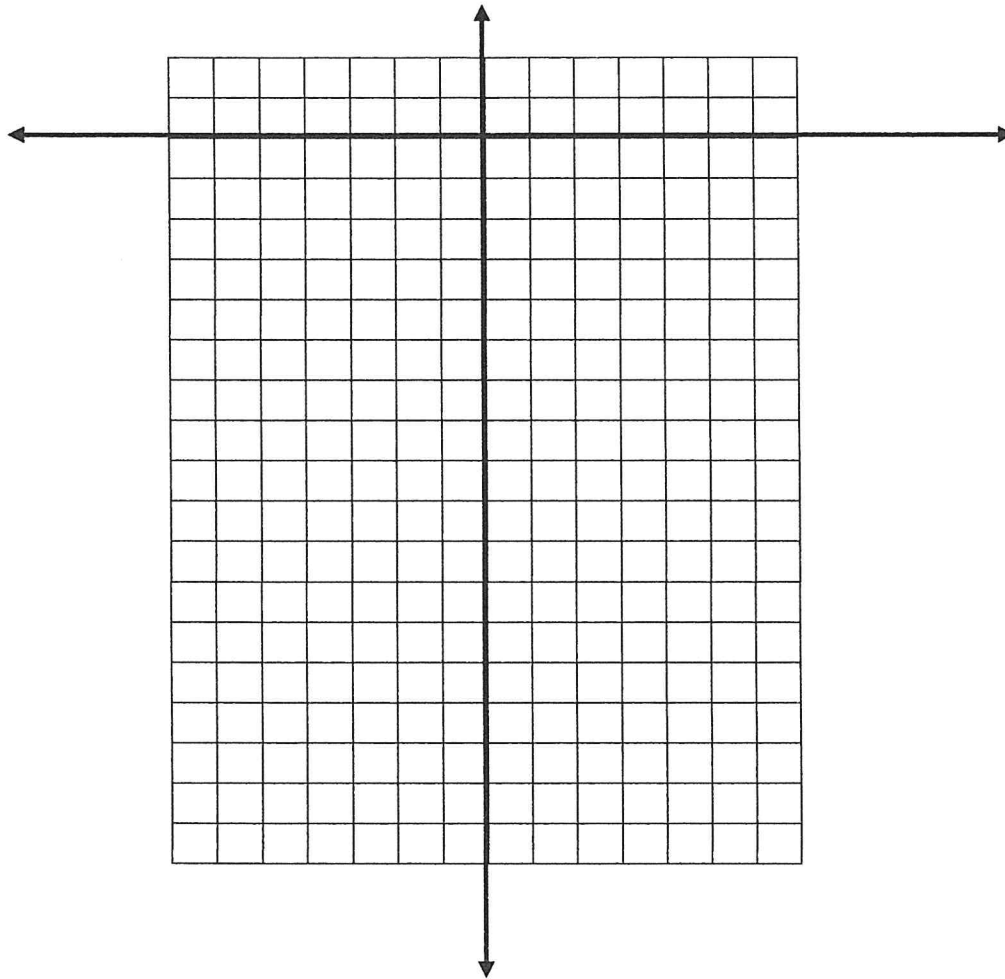
|                   |  |                           |  |
|-------------------|--|---------------------------|--|
| Mapping notation: |  | Transformations:          |  |
| Vertex:           |  | Axis of symmetry:         |  |
| y-intercept:      |  | End behaviour:            |  |
| x-intercept(s):   |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

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



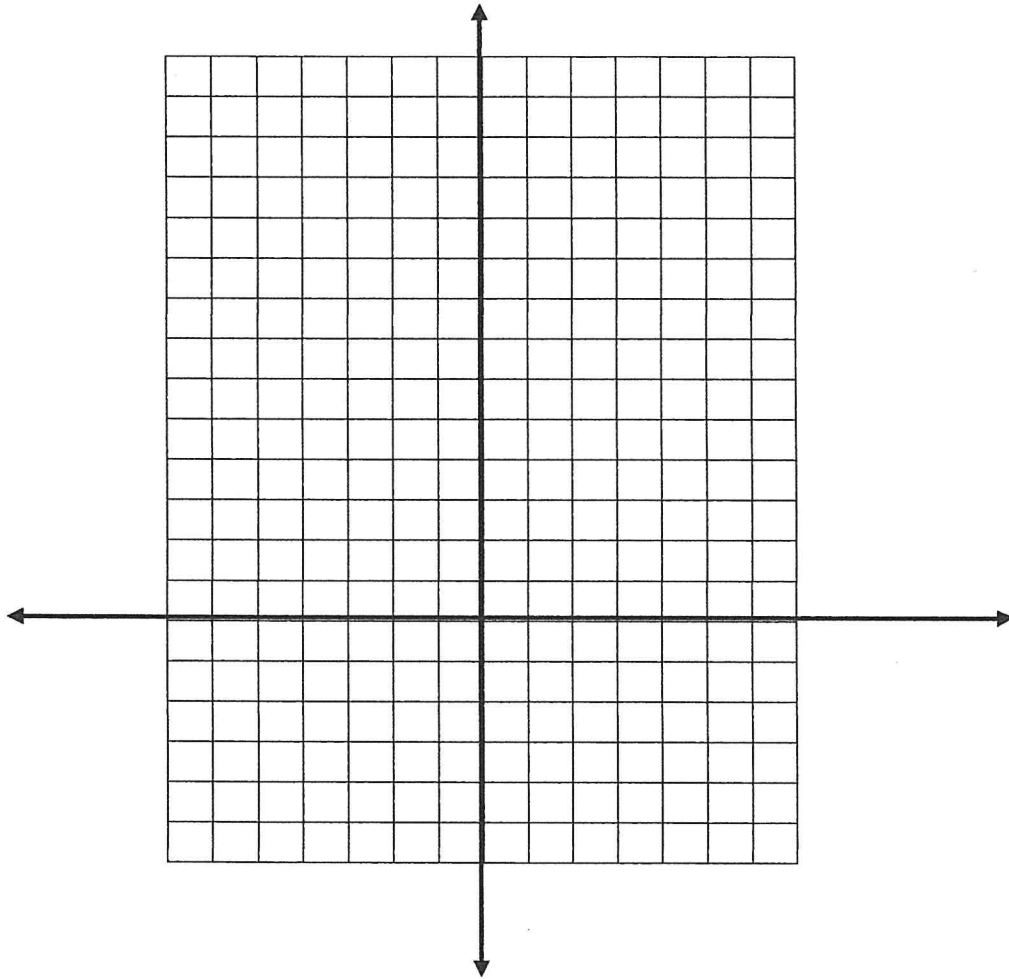
|                   |  |                           |  |
|-------------------|--|---------------------------|--|
| Mapping notation: |  | Transformations:          |  |
| Vertex:           |  | Axis of symmetry:         |  |
| y-intercept:      |  | End behaviour:            |  |
| x-intercept(s):   |  | Maximum or Minimum 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 Minimum 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 Minimum 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  $x = a \text{ real number}$ . 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.