1. Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_ Period: \_\_\_\_\_\_\_\_\_\_

**Quadratic Functions Project: Mathematics and the Arts**

1. Find an example of the graph of a quadratic function in a work of art or architecture. Make a copy of the picture of art/architecture.



1. Draw a coordinate graph system over the picture of the work of art or architecture that you’ve chosen (you may need to enlarge the quadratic part of the artwork to draw a set of coordinate axes.  If so, please include a copy of the original work of art or architecture as well).  Mark the scale clearly.  (You may do this with tracing paper, graph paper, or on the computer.)
2. Find the coordinates of at least five points on your graph.
   1. One of the points must be the vertex.
   2. Label the vertex, axis of symmetry, and *y*-intercept. Is the vertex the maximum or minimum?
   3. Label the *x*-intercept(s)
   4. Identify the domain and range
3. Present your results in a well written report or neat, well organized poster.
   1. Your report/poster should include information about the *actual* size of your artwork as well as the scale that was used in your copy of the picture.
   2. Make sure that your poster/paper includes at least 3 interesting facts related to your piece of artwork and a detailed description of the location of your personal photo (see step 5).
   3. Cite your sources.
4. Take a picture of a parabola. You may find the parabola at home, in your neighborhood, or at school. Repeat steps 1 – 4 for your picture.

Other information:

* This project is to be completed independently. No two students can use the same piece of artwork/architecture.
* WARNING!!! Some pictures may appear to be parabolas but may not actually be real parabolas. If your artwork is not a true parabola, but is close, please make sure that you state that in your project and presentation.

**---------------------------------------------------------------------------------------------------------------------**

**Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Period: \_\_\_\_\_\_\_**

**Project Idea Submission Form**

**(Detach this form and submit your project idea to Mrs. Collins by 4/17)**

**Piece of Artwork/Architecture: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Source: (where did you find it? )\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**\_

**Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_ Period: \_\_\_\_\_\_**

**Project Title: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

Use the following rubric as a “checklist” to help you as you complete your project. Please turn in this rubric on the day you present your project. It will be used to score your project.

***Rubric:***

|  |  |  |
| --- | --- | --- |
| **Criteria** | **Points possible** | **Points earned** |
| Art/architecture  *A coordinate graph was accurately* ***drawn*** *and* ***labeled*** *over a copy of the original piece of parabola artwork. An accurate scale was included on the graph, showing the relationship between the picture size and the* ***actual*** *size of the artwork/architecture.* | 10 |  |
| Art/architecture  *An original copy of the piece of parabola artwork, without the coordinate plane, was included.* | 5 |  |
| Art/architecture  *At least 5 points were accurately labeled on the graph of the parabola.* | 10 |  |
| Personal Photo  *A coordinate graph was accurately* ***drawn*** *and* ***labeled*** *over a copy of the photo. An accurate scale was included on the graph, showing the relationship between the picture size and the* ***actual*** *size of the parabola.* | 10 |  |
| Personal Photo  *An original copy of the picture, without the coordinate plane, was included.* | 5 |  |
| Personal photo  *At least 5 points were accurately labeled on the graph of the parabola.* | 10 |  |
| *Results were presented in a well written report or neat, organized poster.*  *Report/Poster included at least 3 interesting facts about the piece of artwork/architecture. A detailed description of the location of your personal photo was included.* | 30 |  |
| *All sources were cited. (i.e. where did you get the picture? Where did you get the actual measurements? Any other resources used?)* | 5 |  |
| IN Class  *(For each graph) A quadratic Regression equation was found and labeled. A 6th point was labeled and tested in the regression equation. If it is not a true parabola, the error factor was discussed.* | 15 |  |
| **Total** | **100** |  |