Honors Algebra 2 Names \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Function Families Project \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**The project is due Thursday, February 2.**

Project Overview: In Algebra II, you have studied a variety of parent functions and their transformations. For this project, you will create a representation of the six function families listed below with transformations. You will work with a partner. Each partner must contribute equally, which means each partner is responsible for three function families.

You and your partner will decide on the form of your project. Some suggestions are:

* a picture on graph paper
* a family tree
* a scrap book

You and your partner may have a different idea. Just make sure you get it approved by Mrs. Bridges before you begin work.

**Directions:**

1. Decide which functions each partner will represent. **Make sure all 6 parent functions are represented.** Work out a rough draft to make sure everything is included.

|  |  |
| --- | --- |
| **Name of Function** | **Parent Function** |
| Linear |  |
| Quadratic |  |
| Cubic |  |
| Absolute value |  |
| Square Root |  |
| Cube root |  |

1. **Individually,** fill in **your** Function Families worksheet. Include the following: name of the function, equation for the function, the domain and range of the function, and the end behavior of the function. Use interval notation for the domain and range of each function.
2. Graph each parent function. **Make sure the vertex and 2 other points of the function are graphed correctly.**  Highlight each parent function in yellow.
3. Each partner will then include two transformations for two of their three parent functions. Use the transformation rules listed below. Write the equation for each transformation on your Function Families worksheet. Highlight each transformation in a different color and indicate that color on the Function Families worksheet. Each partner must use at least four different transformationsin the project.

Rules for Transformations of Functions

* y = f(x) + k moves f(x) k units up
* y = f(x) - k moves f(x) k units down
* y = f(x - h) moves f(x) h units to the right
* y = f(x + h) moves f(x) h units to the left
* y = -f(x) flips the graph over the x-axis
* y = f(-x) flips the graph over the y-axis
* y = a(f(x)), two things can happen:

– If |a| > 1, there is a vertical stretch

– If 0 < |a| < 1, there is a vertical compression (horizontal stretch)

**Evaluation Form for Function Families Project Name** **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Use the following rubric to conscientiously self-evaluate your work before turning in. Have a peer from another team evaluate your work as well.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **REQUIREMENT** | **POINT VALUE** | **SELF-EVALUATION** | **PEER-EVALUATION** | **TEACHER**  **EVALUATION** |
| **Parent Function 1**  **Equation: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**  Name of function family and its equation are on the project worksheet. | **2** |  |  |  |
| The domain and range of the function are correctly identified using the correct notation. | **2** |  |  |  |
| The end behavior of the function is correct. | **2** |  |  |  |
| Parent function is graphed neatly and correctly (with vertex and 2 other points labelled) and is highlighted in yellow. | **3** |  |  |  |
| **Transformation 1**  **Equation: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**  The equation is correct and matches the description of the transformation. | **3** |  |  |  |
| The transformation is graphed neatly and accurately, and is color coded. | **4** |  |  |  |
| **Transformation 2**  **Equation: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**  The equation is correct and matches the description of the transformation. | **3** |  |  |  |
| The transformation is graphed neatly and accurately, and is color coded. | **4** |  |  |  |
| **Parent Function 2**  **Equation: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**  Name of function family and its equation are on the project worksheet. | **2** |  |  |  |
| The domain and range of the function are correctly identified using the correct notation. | **2** |  |  |  |
| The end behavior of the function is correct. | **2** |  |  |  |
| Parent function is graphed neatly and correctly (with vertex and 2 other points labelled) and is highlighted in yellow. | **3** |  |  |  |
| **Transformation 1**  **Equation: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**  The equation is correct and matches the description of the transformation. | **3** |  |  |  |
| The transformation is graphed neatly and accurately, and is color coded. | **4** |  |  |  |
| **Transformation 2**  **Equation: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**  The equation is correct and matches the description of the transformation. | **3** |  |  |  |
| The transformation is graphed neatly and accurately, and is color coded. | **4** |  |  |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Parent Function 3**  **Equation: \_\_\_\_\_\_\_\_\_\_\_\_\_**  Name of function family and its equation are on the project worksheet. | **2** |  |  |  |
| The domain and range of the function are correctly identified using the correct notation. | **2** |  |  |  |
| The end behavior of the function is correct. | **2** |  |  |  |
| Parent function is graphed neatly and correctly (with vertex and 2 other points labelled) and is highlighted in yellow. | **3** |  |  |  |