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

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

**The project is due Friday, February 9.**

Project Overview: In Honors Algebra 2, 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 of 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 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 key point(s) and 2 other points of the function are graphed and labelled correctly.**  Highlight each parent function in yellow.
3. Each partner will include two transformations each for two of their parent functions. The transformation rules are listed below. Write the equation and description for each transformation on your F. F. worksheet. Highlight each transformation in a different color on the F. F worksheet and on the graph. Each partner must use at least two rules in each transformation and use at least four different rules in all. Your transformations **CANNOT GO THROUGH THE ORIGIN.**

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.**

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| --- | --- | --- | --- | --- |
| **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 key point and 2 other points labelled) and is highlighted in yellow. | **2** |  |  |  |
| **Transformation 1**  **Equation: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**  The equation is correct and matches the description of the transformation. | **2** |  |  |  |
| The transformation is graphed neatly and accurately, and is color coded. | **2** |  |  |  |
| **Transformation 2**  **Equation: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**  The equation is correct and matches the description of the transformation. | **2** |  |  |  |
| The transformation is graphed neatly and accurately, and is color coded. | **2** |  |  |  |
| **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 key point and 2 other points labelled) and is highlighted in yellow. | **2** |  |  |  |
| **Transformation 1**  **Equation: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**  The equation is correct and matches the description of the transformation. | **2** |  |  |  |
| The transformation is graphed neatly and accurately, and is color coded. | **2** |  |  |  |
| **Transformation 2**  **Equation: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**  The equation is correct and matches the description of the transformation. | **2** |  |  |  |
| The transformation is graphed neatly and accurately, and is color coded. | **2** |  |  |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **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 key point and 2 other points labelled) and is highlighted in yellow. | **2** |  |  |  |
| **TOTAL** | **40** |  |  |  |