Parent Function

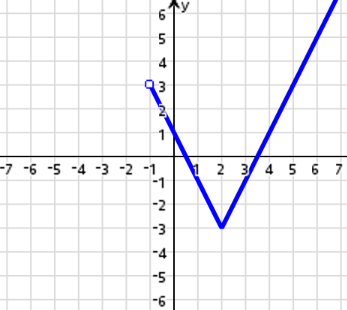
Booklet

By Mathematician:

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Additional Notes:

**Characteristics of Functions**



|  |  |  |
| --- | --- | --- |
| **Domain:**  *(x values - left to right)* | **Range:**  *(y values - bottom to top)* | **Zero(s):**  *(x-intercept)* |
| **End Behavior:**  *(describes what is happening on left and right sides)*  As  As | | |

|  |  |
| --- | --- |
| Chart, line chart  Description automatically generated | Chart, line chart  Description automatically generated |
| **Increasing Interval(s):**  Characteristics of Functions – Module 1  *(graph goes up from left to right)*  **Decreasing Interval(s):**  *(graph goes down from left to right)* | **Positive Interval(s):**  *(graph is above the x-axis)*  **Negative Interval(s):**  *(graph is below the x-axis)* |

**Transformation Equation**

**Vertical Transformations**

*(outsiders: and )*

: vertical dilation and reflection

|  |  |
| --- | --- |
| *( is negative)* |  |

|  |  |
| --- | --- |
|  |  |
|  |  |
|  |  |

vertical translation

|  |  |
| --- | --- |
|  |  |
| *(k is negative)* |  |
| *(k is positive)* |  |

**Hyperbola**

|  |  |  |  |
| --- | --- | --- | --- |
| Center | = transverse radius  = conjugate radius | | = focal radius |
| **Horizontal** | | **Vertical** | |
|  | |  | |
|  | |  | |
| Asymptotes | | Asymptotes | |
| 2 Vertices – units from the center on the transverse axis  2 Foci – units from the center on the transverse axis | | | |

**Parabola**

|  |  |  |  |
| --- | --- | --- | --- |
| Vertex |  | |  |
| **Horizontal** | | **Vertical** | |
|  | |  | |
|  | |  | |
| opens left  opens right | | opens down  opens up | |
| Focus – a point units from the vertex inside the parabola  Directrix – a line units from the vertex outside the parabola | | | |

**Circle**

|  |  |  |
| --- | --- | --- |
| Center | Radius | |
|  | |  |
|  | |  |

**Ellipse**

|  |  |  |  |
| --- | --- | --- | --- |
| Center |  | |  |
|  | = major radius  = minor radius | | = focal radius |
| **Horizontal** | | **Vertical** | |
|  | |  | |
| Diagram, schematic, radar chart  Description automatically generated | | Diagram  Description automatically generated | |
| 2 Vertices – units from the center on the major axis  2 Foci – units from the center on the major axis | | | |

|  |  |  |  |
| --- | --- | --- | --- |
|  |  |  |  |
|  |  |  |  |

**Horizontal Transformations**

*(insiders: b and h)*

horizontal dilation and reflection, liar -

|  |  |
| --- | --- |
| *( is negative)* |  |

|  |  |
| --- | --- |
|  |  |
|  |  |
|  |  |

horizontal translation, liar -

|  |  |
| --- | --- |
|  |  |
| *(h is negative)* |  |
| *(h is positive)* |  |

Parent Function Name: **Linear**

Equation:

Graph:

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Chart, line chart, scatter chart  Description automatically generated | |  |  | | --- | --- | |  |  | |  |  | |  |  | |  |  | |  |  | |  |  | |

Transformation Equation:

Domain:

Range:

|  |
| --- |
| Needed to Write Equation: |

Additional Notes:

Parent Function Name: **Logarithmic**

Equation:

Graph:

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Chart, line chart, scatter chart  Description automatically generated | |  |  | | --- | --- | |  |  | |  |  | | 1 |  | |  |  | |

Transformation Equation:

Domain:

Range:

|  |
| --- |
| Needed to Write Equation:  Point  Slope |

Additional Notes:

Slope

|  |  |
| --- | --- |
| Horizontal Line | Vertical Line    undefined |

|  |  |  |
| --- | --- | --- |
| Slope-Intercept Form | Point-Slope Form | Standard Form |

Parent Function Name: **Absolute Value**

Equation:

Graph:

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Chart, line chart, scatter chart  Description automatically generated | |  |  | | --- | --- | |  |  | |  |  | |  |  | |  |  | |  |  | |  |  | |

Transformation Equation:

Domain:

Range:

|  |
| --- |
| Needed to Write Equation: |

Additional Notes:

Parent Function Name: **Exponential**

Equation:

Graph:

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Chart, line chart, scatter chart  Description automatically generated | |  |  | | --- | --- | |  |  | |  |  | |  |  | |  |  | |

Transformation Equation:

Domain:

Range:

|  |
| --- |
| Needed to Write Equation: |

Additional Notes:

Parent Function Name: **Quadratic**

Equation:

Graph:

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Chart, line chart, scatter chart  Description automatically generated | |  |  | | --- | --- | |  |  | |  |  | |  |  | |  |  | |  |  | |  |  | |

Transformation Equation:

Domain:

Range:

|  |
| --- |
| Needed to Write Equation: |

Additional Notes:

Parent Function Name: **Cube Root**

Equation:

Graph:

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Chart, line chart, scatter chart  Description automatically generated | |  |  | | --- | --- | |  |  | |  |  | |  |  | |  |  | |  |  | |  |  | |

Transformation Equation:

Domain:

Range:

|  |
| --- |
| Needed to Write Equation: |

Additional Notes:

Parent Function Name: **Cubic**

Equation:

Graph:

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Chart, line chart, scatter chart  Description automatically generated | |  |  | | --- | --- | |  |  | |  |  | |  |  | |  |  | |  |  | |  |  | |

Transformation Equation:

Domain:

Range:

|  |
| --- |
| Needed to Write Equation: |

Additional Notes:

Parent Function Name: **Square Root**

Equation:

Graph:

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Chart, line chart, scatter chart  Description automatically generated | |  |  | | --- | --- | |  |  | |  |  | |  |  | |  |  | |  |  | |  |  | |

Transformation Equation:

Domain:

Range:

|  |
| --- |
| Needed to Write Equation: |

Additional Notes:

Parent Function Name: **Rational**

Equation:

Graph:

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Chart, line chart, scatter chart  Description automatically generated | |  |  | | --- | --- | |  |  | |  |  | |  |  | |  |  | |  |  | |  |  | |  |  | |  |  | |

Transformation Equation:

Domain:

Range:

|  |
| --- |
| Needed to Write Equation: |

Additional Notes: