**Unit 3 #1 PARENT FUNCTIONS & TRANSFORMATIONS: ABSOLUTE VALUE & SQUARE ROOT**

**ABSOLUTE VALUE PARENT FUNCTION**

 Graph: Equation: Table:

|  |  |
| --- | --- |
| x | f(x) |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |

f(x) = |x|



 Domain:

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

 Range:

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

**QUADRATIC PARENT FUNCTION**

 Graph: Equation: Table:

|  |  |
| --- | --- |
| x | f(x) |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |

f(x) = x2



 Domain:

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

 Range:

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

**SQUARE ROOT (RADICAL) PARENT FUNCTION**

 Graph: Equation: Table:

|  |  |
| --- | --- |
| x | f(x) |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |

f(x) = $\sqrt{x}$



 Domain:

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

 Range:

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

**CUBIC PARENT FUNCTION**

 Graph: Equation: Table:

|  |  |
| --- | --- |
| x | f(x) |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |

 f(x) = x3



 Domain:

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

 Range:

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

**CUBE ROOT PARENT FUNCTION**

 Graph: Equation: Table:

|  |  |
| --- | --- |
| x | f(x) |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |

 f(x) = $\sqrt[3]{x}$



 Domain:

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

 Range:

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

**TRANSLATING PARENT FUNCTIONS**

1. If f(x) = x2 is translated 3 units up and 1 unit left, what is the new equation? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. If f(x) = x3 is translated 3 units down and 2 units right, what is the new equation? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. If f(x) = $\sqrt[3]{x}$ is translated 3 units up and 4 units left, what is the new equation? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**IDENTIFYING TRANSFORMATIONS**

Identify the transformation AND the parent function of the following:

1. f(x) = (x – 4)2 + 3

Parent Function: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Transformations: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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

1. f(x) = (x + 1)3 – 7

Parent Function: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Transformations: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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

1. f(x) = $\sqrt[3]{x-8}$ + 2

Parent Function: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Transformations: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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

|  |
| --- |
| **TRANSFORMATION RULES** |
| f(x) | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ function |
|  | Horizontal shift h-units to the left |
| f(x-h) | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ shift h-units to the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| f(x) + k | Vertical shift k-units \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
|  | Vertical shift k-units down |
| a f(x), a > 1 | Vertical \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of f(x) 🡪 gets \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| -f(x) | Vertical \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_/flip of f(x) (over \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_) |

|  |
| --- |
| **TRANSFORMATION RULES** |
| f(x) | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ function |
|  | Horizontal shift h-units to the left |
| f(x-h) | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ shift h-units to the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| f(x) + k | Vertical shift k-units \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
|  | Vertical shift k-units down |
| a f(x), a > 1 | Vertical \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of f(x) 🡪 gets \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| -f(x) | Vertical \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_/flip of f(x) (over \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_) |

|  |
| --- |
| **TRANSFORMATION RULES** |
| f(x) | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ function |
|  | Horizontal shift h-units to the left |
| f(x-h) | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ shift h-units to the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| f(x) + k | Vertical shift k-units \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
|  | Vertical shift k-units down |
| a f(x), a > 1 | Vertical \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of f(x) 🡪 gets \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| -f(x) | Vertical \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_/flip of f(x) (over \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_) |

|  |
| --- |
| **TRANSFORMATION RULES** |
| f(x) | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ function |
|  | Horizontal shift h-units to the left |
| f(x-h) | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ shift h-units to the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| f(x) + k | Vertical shift k-units \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
|  | Vertical shift k-units down |
| a f(x), a > 1 | Vertical \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of f(x) 🡪 gets \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| -f(x) | Vertical \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_/flip of f(x) (over \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_) |

|  |
| --- |
| **TRANSFORMATION RULES** |
| f(x) | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ function |
|  | Horizontal shift h-units to the left |
| f(x-h) | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ shift h-units to the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| f(x) + k | Vertical shift k-units \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
|  | Vertical shift k-units down |
| a f(x), a > 1 | Vertical \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of f(x) 🡪 gets \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| -f(x) | Vertical \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_/flip of f(x) (over \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_) |