Parent Functions and their Transformations

All graphs we encounter are just transformations of their parent function. A parent function is the simplest function that still satisfies the definition of a certain type of function.

Example:

F(x) = 2(x-1) + 3  This is a linear function.
F(x) = x  This is the parent function for a linear function.

Graph of parent function:

![Graph of parent function]

If we replace the numerical values with variables “h”, “k”, and “m”, we would get:

F(x) = m(x-h) +k  “m” = Slope
               “h” = Horizontal Shift
               “k” = Vertical Shift

Looking back at our original function, we can see that our m = 2, h = 1, and k = 3. This means that our graph has a slope of 2, a vertical shift of 3, and a horizontal shift of 1.

Graph of our function:

![Graph of our function]
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Parent Functions of other graphs:

F(x) = c  \quad \text{“c” = Constant}

F(x) = x  \quad F(x) = m(x-h)+k

F(x) = x^2  \quad F(x) = (x-h)^2+k

F(x) = x^3  \quad F(x) = (x-h)^3+k

F(x) = |x|  \quad F(x) = |x-h| + k

F(x) = \sqrt{x}  \quad F(x) = \sqrt{x-h} + k