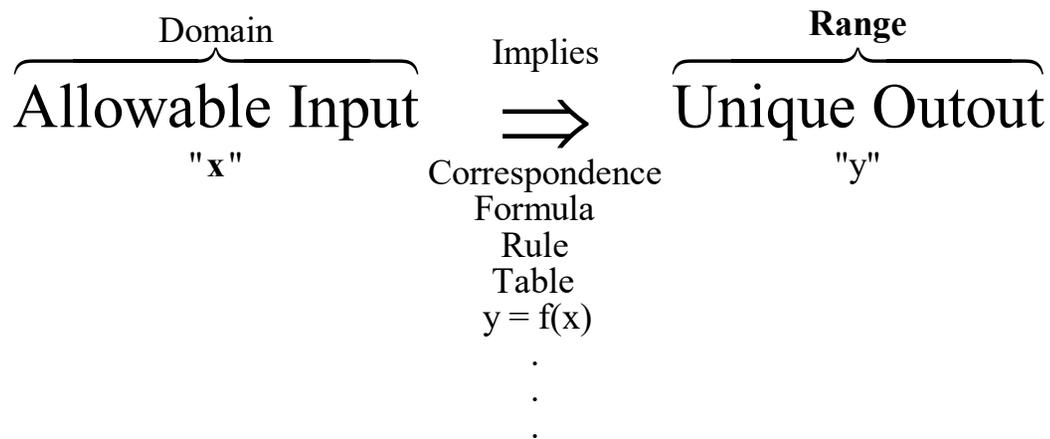


FUNctions – FUNction Summery Method

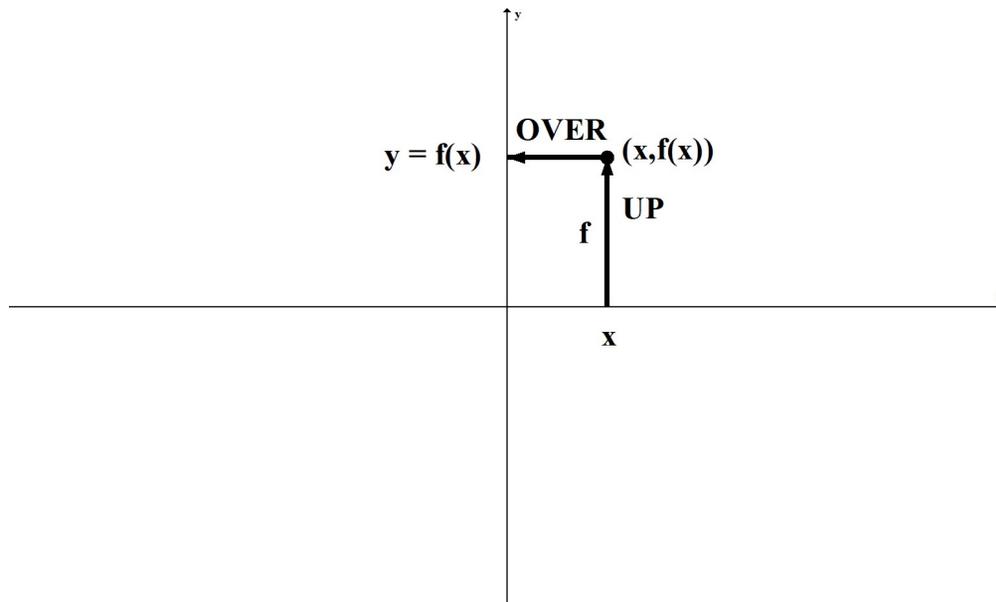
$$y = \overset{\text{Name}}{\underset{\text{Input}}{\mathbf{f}}}\left(\underset{\text{Output}}{\mathbf{x}}\right) = \text{formula}$$

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Basic FUNction Idea/Concept:



Given x-values, we find the corresponding $y = f(x)$ values, form ordered pairs $(x, f(x))$, and “plot” some of them in the number plane to construct a geometrical representation of the function **f**:



Plotting points, i.e. ordered pairs $(x, f(x))$, may **NOT** give an accurate geometrical representation.

Hence, we start with **Basic FUNctions**: identity, square, cube, absolute identity, square root, ... where it is *relatively* easy to understand their

1. Analytical nature: **Domain** \rightarrow **Correspondence** \rightarrow **Range**
2. Geometrical nature: **Graph**

Then we use them to construct more complicated functions, find the important properties they possess,

1. Domain
2. Intercepts
3. Continuity
4. Behavior at Infinity
5. Odd/Even
6. Increasing and Decreasing
7. Relative Minimum and Maximum Points
8. Concavity
9. Inflection Points
10. Graph
11. Absolute Minimum and Maximum Points
12. Range

and use them to construct *accurate* graphs.

In summary, we start with $y = f(x) = \text{formula}$ and find the first nine properties. These are like puzzle pieces and with them we construct an *accurate* graph – Property 10. We then use the graph to identify Properties 11 and 12 and write down any appropriate comments germane to our analysis.