In this course, we will work with functions given in one of four ways:

- as a formula
- as a graph
- as a table of values
- in words.

In the case of a formula, the functions we will work with will all be built out of the Basic Three types of functions, as listed below. The ways in which we will combine these Basic Three to make other functions are listed below. It is very helpful, for a number of reasons, to recognize this “function ancestry.” Below is a listing of the Basic Three, as well as each of the five ways (arithmetic combinations, function composition, inverses, piecewise, and domain restriction) that we will use them to make the other functions to be used in this course.

- the Basic Three:
  - power functions (includes roots, reciprocals, and constant functions, in addition to the “usual” power functions like $x^2$)
  - exponential functions (includes functions like $2^x$, as well as the usual $e^{3x}$ or $e^{-5x}$)
  - trig functions (This refers to sine and cosine only. The other “trig functions”, like tangent, are included in a later category, since they are each built out of sines and cosines.)

- Combining the Basic Three:
  - arithmetic combinations
    * linear combinations (i.e. sums of constant multiples of Basic Three functions. This includes linear functions, polynomials, and many more.)
    * other arithmetic combinations: sums, differences, products, and quotients (includes rational functions, the other four trig functions, vertical shifts, some dilations, and many more)
  - function composition (includes horizontal shifts, some dilations, and many more)
  - inverse functions (includes logarithms, inverse trig functions, and many more)
  - piecewise functions
  - domain restriction