Goals of this Section

This section is on functions, their roles, their graphs, and we introduce the Library of Functions

By the end of this section students should be able to:

- Know what makes a relationship a function, and why that is important.
- Know how to invert a function to get an inverse relation.
- Know when a function has a true inverse function.
- Name and graph all the functions in the library of functions.
- Find the domains (and in some cases ranges) of the parent functions as well as their manipulations.
- Use the universal manipulations to move and scale graphs, as well as to know when graphs have been moved or scaled.

In this part we aim to answer the following questions:

- When is a "mathematical relationship" a "function"?
- Why are functions so special? ie why do we care?
- What are some useful properties of functions?
- What does a graph tell you? What does it not tell you?
- When is it important to be precise? How precise must you be?
- What is the use of imprecise (aka approximate) data?
- What are the "Archetypical Functions" of precalculus?
- How does knowledge of these functions help (ie, why is this useful)?
- What does it mean to "solve" a function?
- What kind of behavior is fundamental/universal to functions?
- What kinds of things can one do to *any* function, even if they don't know what the function actually is?
- What is the virtue of manipulating functions using transformations and translations?
- What kinds of things are of universal interest, regardless of what the function actually is?

Learning outcomes: