Section 4.1

Linear Functions

LINEAR FUNCTIONS

A **linear function** is a function of the form

$$f(x) = mx + b$$

The graph of a linear function is a line with slope m and y-intercept b. Its domain is the set of all real numbers.

AVERAGE RATE OF CHANGE OF A LINEAR FUNCTION

Linear functions have a constant average rate of change. That is, the average rate of change of a linear function $f(x) = mx + b$ is

$$\frac{\Delta y}{\Delta x} = m$$

INCREASING, DECREASING, AND CONSTANT LINEAR FUNCTIONS

A linear function $f(x) = mx + b$ is:

- increasing over its domain if its slope, m, is positive
- decreasing over its domain if its slope, m, is negative.
- constant over its domain if its slope, m, is zero.