Library of functions:

- Polynomials

- Rational functions

- Exponential functions

- Radical functions

- Logarithmic functions

- Trigonometric functions

- Inverse trig. Functions

Domain and range for all functions➔ Piecewise - defined functions.

Transformations of functions:

- Composition of functions

- Inverse functions and logarithms:

Solve equations:

a) Linear / quadratic/ exponential/logarithmic / and trig equations:

Construction of functions:

Ex: Let P be a point on $f(x) = x^3 + 2$ and a point A (1,1).

a) Express the area of a circle center and at A and radius from A to P, as a function of x.

b) Find the domain of the area function. $A(3)$ *and* $A(-2)$

Chapter 2

Section 2.1: The tangent and velocity problems

Average velocity = $\dfrac{\text{distance traveled}}{\text{time elapsed}}$

For a distance function $d = f(t) \Rightarrow$ Velocity: $v_{avg} = \dfrac{f(b) - f(a)}{b - a} = \dfrac{\Delta y}{\Delta x}$

Instantaneous velocity is what exactly the speed at a particular time. (Snap shot)

Ex: From the top of a 250 ft high building, you throw a ball into the air with an initial velocity of 25 ft/sec. The height in feet after t seconds of the ball is given by

$$h(t) = -16t^2 + 25t + 250$$

a) Find the average velocity for the time period beginning when t = 1 and lasting
(i) 0.5 second

(ii) 0.1 second

(iii) 0.05 s

(iv) 0.001 s

b) Find the instantaneous velocity when t = 1.

Given a function f(x) and two different points on the function ➔ define the slope of a secant line, and slope of a tangent line. Demonstrate the above concept by graphing

Ex: Given a function $f(x) = x^3 - 2$. Find the equation of a secant line passing through x=-1 and x=2.