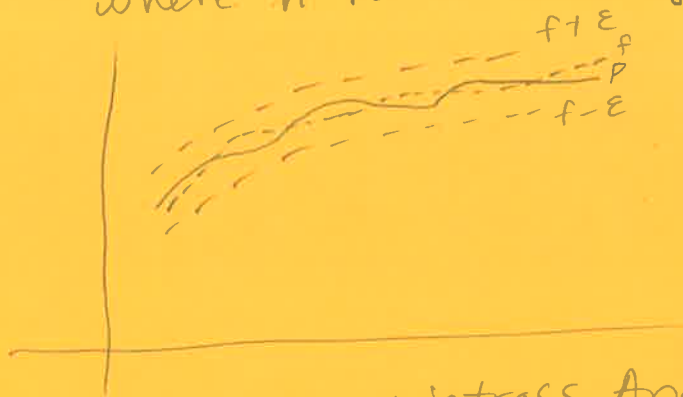# Interpolation and Polynomial Approximation

We want to estimate and interpolate functions for which only a limited number of points are known.

To do this, we want to use the class of algebraic polynomials; which is the set of functions

$$P_n(x) = a_0 + a_1 x + a_2 x^2 + \cdots + a_n x^n$$

where n is a nonnegative integer, and the a_is are constant

Thm 3.1   Weistrass Approx Thm

If f is defined and continuous on $[a,b]$ and $\varepsilon > 0$ is given, then there exists a polynomial P, defined on $[a,b]$ with the property that

$$|f(x) - P(x)| < \varepsilon \quad \forall \; x \in [a,b]$$

<u>Note</u>: Taylor polynomials are not good to use here!
Taylor are used to generate numerical procedures, not appropri
function