# ENG1005 Week 1 Lecture 1

* Fundamental Theorem of Calculus (§ 8.75 in textbook)
* Substitution (§8.8.6 & 8.8.12)
* Substitution Algorithm
  + Given an integral
  + Then we might try to find functions and u such that
  + Then
  + Now, if (u) has an anti-derivative
  + Then we have­­­
  + Note: same formula which follows from integrating chain rule
  + Example 1)
  + Example 2:

Let :

Therefore:

* + Example 3:

Let u = sin(x):

Therefore:

* Integration by Parts (§8.8.4)

(Note:

* + **The formula:**
  + Example 1
  + Example 2
  + Hyperbolic functions (§ 2.7.4)
    - Definitions:
    - Properties
    - Inverse hyperbolic functions