1. **Differentiation and Integration**

(9.1) **Theorem**: Let Riemann integral bounded function on and let function , then .

**Proof:** let partition of .

Since differentiable by using mean value theorem

sup and inf,

Since Riemann integral on .

(9.2) **Theorem**: (**Leibnizs Rule**)

If a function continuous and , differentiable functions , then

**Riemann-Stieltjes Integral**

(9.3) **Definition:** Let bounded function and increasing function partition of . Define

Since and does not decreasing, then

(9.4) **Definition:** Let bounded function and increasing function. We say that integrable respect to , if

(9.5) **Example:** Let bounded function and constant function , then integrable respect to and .

**Solution:**

and

integrable respect to and .

(9.6) **Example:** Let constant function and let not decreasing function, then integrable respect to and .

**Proof:** let partition of .

sup

inf

integrable respect to and .