1. **Riemann Integral** 
   1. **Definition**: Let is a bounded function and is a partition of interval .

sup , inf ,

sup , inf ,

sinceis a bounded, we get on .

Define ,

Where is an upper Riemann set, is a lower Riemann set. Also

* 1. **Example**: Find , of function defined as respect to partition .

**Solution:** .

* 1. **Theorem:** Let is a bounded function and partition of , then are bounded functions and .

**Proof:** since bounded

* 1. **Theorem:** Let is a bounded function and let partitions of , if refinement of (), then
  2. **Corollary:** Let is a bounded function and let partitions of , then
  3. **Definition**: Let is a bounded function. Define

,

if , then

And then

inf sup

* 1. **Theorem:** Let is a bounded function, then .

**Proof:** since every element of is less or equal than every element of , so

sup

* 1. **Definition**: Let is a bounded function. We said that integrable Riemann on , if .

In this case we write .

* 1. **Theorem:** Let define as , then integrable Riemann on and .

**Proof:** let any partition of .

And then integrable Riemann on and .

* 1. **Notes:**

1. .
2. .
3. .
4. .
   1. **Example:** Let a function defined as . Prove that .

**Solution:** since bounded let partition of consists of partial intervals.

sup

inf

If , then

Since but this is contradiction (Archimedes property)

And then

So, we have

* 1. **Example:** Let a function defined as , show that does not integrable Riemann on .

**Solution:** we note that bounded.

Let is a partition of interval .

sup

inf

does not integrable Riemann on .