1. **Series of Functions**
   1. **Definition**: Let is a sequence of real value and defined on . we define . We said that an infinite series converges to , if converges. We said that converges on , if converges to on , (this means ) . If diverges (this means does not exist) we say that diverges.
   2. **Theorem**: An infinite series is uniformly converges on .
   3. **Note**: We said that absolutely converges to , if converges.
   4. **Example**: Let a function is defined as , if each one of continuous on , then uniformly converges to on , then continuous.

**Solution:** with , so converges and , if

converges, if .

* 1. **Theorem:** Let is an infinite series. If every function of is continuous on and uniformly converges to on , then is continuous.

**Power Series**

* 1. **Definition**: Let is a sequence of constants, is a power series in . is a power series in is a constant.
  2. **Examples**:

1. A power series converges .
2. A power series converges where and diverges where .
3. .
   1. **Theorem:** If converges to , then absolutely converges .
   2. **Corollary:** If diverges at , then diverges .
   3. **Theorem:** For any be one of the following:
4. converges only where .
5. absolutely converges where .
6. There is absolutely converges where and diverges where .
   1. **Theorem:**
7. If , then convergent half of is .
8. If absolutely converges at one side of interval, then absolutely converges to other side.
9. If is a radius of convergent , then radius of is .