**Limit**

**Evaluate:**

**1.**

**2.**

**3.**

**4.**

**5.**

**6.**

**7.**

**8.**

**9.**

**1.**

**2.**

**3.**

**4.**

**(a)** When ,

**(b)** When ,

**(i)** When a = b,

**(ii)** When a = -b,

The sequence oscillates between . The limit does not exist.

**(c)** When ,

**5.** **Method 1**

Let

Then

As

Hence

**Method 2** Put

As

**6.**

Since

By Sandwich Theorem,

**7.**

**8.**

Let

**9.** Prove by induction,

Let P(n):

For P(1),

Assume P(k) is true for some , that is, …. (\*)

For P(k+1),

since

Therefore P(k+1) is true.

By the Principle of Mathematical Induction, P(n) is true for all

Hence, we have

By Sandwich Theorem,

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