**Section 11.5: Alternating Series**

**Alternating Series:**

**Definition:** An ***alternating series*** is a series whose terms alternate signs. For example,

**Alternating Series Test (AST):** If the alternating series

or

satisfies

(i) for all ; that is, is a decreasing sequence, and

(ii)

then the series is convergent.

NOTES:

(a) The terms of must be decreasing () and . If , then the series diverges by the *n*th-Term Test.

(b) If the series is not an alternating series, does *not* insure convergence!

Examples:

**Approximating the Sum of an Alternating Series**

**Theorem:** If a convergent alternating series satisfies the condition , then the absolute value of the remainder involved in approximating the sum by is less than (or equal to) the first neglected term. That is,

Example: Approximate the sum of the following series by its first six terms. Find a bound for the error in your approximation.