**Part II: Alternating Series Remainder for the Sum:**

**If an alternating Series converges, the sum of the alternating series can be approximated with a remainder by**

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| Proof:  |
|  **Example 1) Approximate the sum of the series  for its first six terms.** |

**Example 2) Determine the number of terms required to approximate the sum of the series, with an error of less than three decimal places.**

Practice) **Approximate the sum of the series  for its first six terms.**