Problems for Gateway #1: Convergence of an Infinite Series

1. The condition $a_k \to 0$ as $k \to \infty$ is sufficient to:

(a) Guarantee that the series: $a_1 + a_2 + a_3 + \ldots$ converges.

(b) Guarantee that the series converges to positive infinity as $k \to \infty$.

(c) Guarantee nothing about the convergence about the series.

(d) Guarantee that the series converges to zero as $k \to \infty$.

2. The condition $a_k \to 0$ as $k \to \infty$ is a necessary prerequisite for:

(a) Convergence of the series.

(b) Convergence of the series to zero.

(c) Divergence of the series.

(d) Divergence of the series to a number other than zero.

3. A test that will determine the convergence of a ***FINITE*** series is:

(a) The ratio test.

(b) The comparison test.

(c) If the terms in the series are a_k then if $a_k \to 0$ as $k \to \infty$ then the series must converge.

(d) No test is necessary as a finite series will always converge.

4. A convergent geometric series: $a + ar + ar^2 + ar^3 + \ldots$

(a) Does not obey the condition $a_k \to 0$ because a_k is not defined.

(b) Obeys the condition that $a_k \to 0$ but only when $-1 < a < 1$.

(c) Does not obey the condition $a_k \to 0$ when r is a negative number.

(d) Obeys the condition that $a_k \to 0$ irrespective of the value of a.

5. The sum of an infinite series is:

(a) Always equal to plus infinity or minus infinity.

(b) Possibly finite, possibly infinite, or may not exist at all depending on the particular series.

(c) Equal to plus infinity unless most of the terms added together are equal to zero.

(d) Impossible to determine precisely as you can never actually add an infinite number of terms.

Answers

1.	C	2.	A	3.	D	4.	D	5.	B