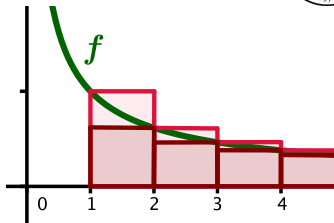## The Integral Test

Question

The figure shows the graph of a function f. If $a_n = f(n)$ for $n \geq 1$, then which of the following statements must be true?

A. $\displaystyle\int_1^\infty f(x)\ dx \leq \sum_{n=1}^\infty a_n$

B. $\displaystyle\sum_{n=2}^\infty a_n \leq \int_1^\infty f(x)\ dx.$

C. If $\int_1^\infty f(x)\ dx$ converges, then $\displaystyle\sum_{n=1}^\infty a_n$ converges.

D. If $\int_1^\infty f(x)\ dx$ diverges, then $\displaystyle\sum_{n=1}^\infty a_n$ diverges.

(There could be more than one right answer.)