

True or False?

1. If $0 \leq a_n \leq b_n$ and $\sum b_n$ diverges, then $\sum a_n$ diverges.
2. If $\sum a_n 6^n$ converges, $\sum a_n 2^n$ converges.
3. Let s_n be the n -th partial sum of the series $\sum a_n$. If $\lim_{n \rightarrow \infty} s_n = 3$, then $\lim_{n \rightarrow \infty} a_n = 0$.
4. If $a_n > 0$ and $\lim_{n \rightarrow \infty} (a_{n+1}/a_n) < 1$, then $\lim_{n \rightarrow \infty} a_n = 0$.
5. The series $\sum n^{-\sin 1}$ is convergent.
6. $\sum 1/n(\ln n)^p$ converges if $p > 1$.
7. The Ratio Test can be used to determine whether $\sum 1/n^3$ converges.
8. The Comparison Test can be used to determine whether $\sum 1/n^3$ converges.
9. If $\{a_n\}$ is positive decreasing and $\lim_{n \rightarrow \infty} a_n = 0$, then $\sum a_n$ converges.
10. Let $a_n, b_n > 0$. If $\lim_{n \rightarrow \infty} (a_n/b_n) = 0$ and $\sum b_n$ diverges, then $\sum a_n$ diverges.
11. The series $\sum \cos(n\pi)$ is divergent.
12. The series $\sum \sin(n\pi)$ is divergent.