Section 8.4: Comparison of Series

A. Convergence and Divergence Tests (Cont.)

6. Theorem 8.12 - Direct Comparison Test: Let \( 0 < a_n \leq b_n \) for all \( n \).
   - If \( \sum_{n=1}^{\infty} b_n \) converges, then \( \sum_{n=1}^{\infty} a_n \) converges
   - If \( \sum_{n=1}^{\infty} a_n \) diverges, then \( \sum_{n=1}^{\infty} b_n \) diverges
   Examples: 4, 6, 8

7. Theorem 8.13 - Limit Comparison Test: Suppose \( a_n > 0, b_n > 0 \), and
   \[
   \lim_{n \to \infty} \left( \frac{a_n}{b_n} \right) = L
   \]
   where \( L \) is finite and positive. The two series \( \sum_{n=1}^{\infty} a_n \) and \( \sum_{n=1}^{\infty} b_n \) either both converge or both diverge.
   Examples: 16, 18, 28, (34)