

**Testing, Testing**

1. **Review.** Each of the following statements is false. Give a brief counterexample for each.

(a) If  $\sum a_n$  converges, so does  $\sum |a_n|$ .

(c) If  $\sum b_n$  diverges, so does  $\sum (a_n + b_n)$  (for any sequence  $a_n$ ).

(b) If  $\sum a_n$  converges,  $\lim_{n \rightarrow \infty} \left| \frac{a_{n+1}}{a_n} \right| < 1$ .

2. Use the Ratio Test to determine whether  $\sum_{n=1}^{\infty} \frac{2^n}{n!}$  converges or diverges.

3. Use the Root Test to determine whether  $\sum_{n=1}^{\infty} \left( \frac{n^{3n}}{7^n} \right)^n$  converges or diverges.