1. Show steps in evaluating \( \lim_{n \to \infty} n - \sqrt{n^2 - 6n} \). (This sequence is defined for which values of \( n \)?)

2. Show steps in evaluating \( \lim_{n \to \infty} a_n \), where \( a_n = \int_1^n \frac{1}{x^p} \, dx \), \( p > 0 \), and \( n \) is a positive integer.

3. Show steps in evaluating \( \lim_{n \to \infty} P^{1/n} \), where \( 0 < P < \infty \).
4. Show steps in evaluating \( \lim_{n \to \infty} n^{1/n} \). (This sequence is defined for which values of \( n \)?)

5. Show steps in evaluating \( \lim_{n \to \infty} \left( 1 + \frac{A}{n} \right)^n \), where \( -\infty < A < \infty \).