Name: _____   Section: _____

Answer all questions and show your work. Unsupported answers may receive *no credit.* You may not use a calculator on this quiz. Allow 15 minutes for the quiz.

1. Consider the sequence $\{a_n\}$ defined by $a_n = 3 \cdot 2^{-n}$ for $n = 1, 2, 3, \ldots$.

   (a) (2 points) Find the limit of the sequence $\lim_{n \to \infty} a_n$.

   (b) (4 points) Explain why the series $\sum_{n=1}^{\infty} a_n$ is convergent and find the sum.

2. Suppose that a recursive sequence is defined by $b_1 = 1$ and $b_n = \frac{1}{2}(b_{n-1} + \frac{3}{b_{n-1}})$.

   (a) (2 points) Find b_3.

   (b) (2 points) Suppose that the sequence b_n is convergent and $B = \lim_{n \to \infty} b_n$ exists. Find an equation that B satisfies.