Reading Quiz #20

姓名：——————————— 系級：———————學號：——————————— 分數：———————

Read Section 12.1(pages 737-746) and work out the following problems.

1. Determine whether the sequence converges or diverges. Evaluate its value if it is convergent.

    (a) $a_n = \left(1 + \dfrac{2}{n}\right)^{1/n}$

    (b) $a_n = \dfrac{\sin 2n}{1 + \sqrt{n}}$

2. A sequence $\{a_n\}$ is given by $a_1 = \sqrt{2}, \quad a_{n+1} = \sqrt{2 + a_n}$.

    (a) By induction, show that $\{a_n\}$ is increasing and bounded above by 3.

    Apply Monotone Convergent Theorem (Theorem 11) to show that $\lim\limits_{n \to \infty} a_n$ exists.

    (b) Find $\lim\limits_{n \to \infty} a_n$.