Math 172 | Quiz 14 | Name: _____

14 June 2016 | Show Appropriate Work | Point Values in boxes.

1. [8] Please circle **T**rue or **F**alse, as appropriate.

   (a) **T** / **F:** The Fibonacci sequence $\{1, 1, 2, 3, 5, 8, 13, \ldots\}$ converges. - diverges to infinity

   (b) **T** / **F:** The sequence $\{-1, 1, -1, 1, -1, 1, \ldots\}$ converges. - oscillates

   (c) **T** / **F:** If $0 < a_n < b_n$ and $b_n \to 0$ as $n \to \infty$, then the sequence $\{a_n\}$ converges. - Squeeze Thm

   (d) **T** / **F** : If $a_n \to 0$ as $n \to \infty$, the sequence $\{a_n\}$ converges. - definition

   (e) **T** / **F**: If $a_n \to 0$ as $n \to \infty$, the series $\sum a_n$ converges. - see below (h)

   (f) **T** / **F** : If $a_n \to 2$ as $n \to \infty$, the sequence $\{a_n\}$ converges. - definition

   (g) **T** / **F**: If $a_n \to 2$ as $n \to \infty$, the series $\sum a_n$ converges. - Test for divergence

   (h) **T** / **F**: The Harmonic series

   $$\sum_{n=1}^{\infty} \frac{1}{n} = 1 + \frac{1}{2} + \frac{1}{3} + \frac{1}{4} + \frac{1}{5} + \cdots$$

   converges.

2. [2] Find examples of sequences with the following properties.

   (a) A sequence that is decreasing.

   $\{-1, -2, -3, -4, \cdots\}$

   (b) A sequence that is bounded but not monotone.

   $\{1, -1, 1, -1, 1, -1, \cdots\}$