Math 172 Quiz 10.1
Sections: 10.1-10.2
22 October 2018

Name: _____

Point values in boxes.

1. [9] Please circle True or False, as appropriate.

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

   (b) (T) / F: If $a_n \to \pi$ as $n \to \infty$, the sequence $\{a_n\}$ converges.

   (c) T / (F:) If $a_n \to \infty$ as $n \to \infty$, the sequence $\{a_n\}$ converges.

   (d) T / (F:) The Fibonacci sequence $\{1, 1, 2, 3, 5, 8, 13, \ldots\}$ converges.

   (e) (T) / F: The Fibonacci sequence $\{1, 1, 2, 3, 5, 8, 13, \ldots\}$ is monotone.

   (f) (T) / F: If $r = -0.3$, the geometric sequence $\{-7r^n\}$ converges.

   (g) T / (F:) If $r = 1.3$, the geometric sequence $\{0.1r^n\}$ converges.

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

   (i) (T) / F: The sequence $\{-1, 1, -1, 1, -1, 1, \ldots\}$ is bounded.

   (j) (T) / F: If $a_n = f(n)$ for $n \in \mathbb{N}$ and $\lim_{x\to\infty} f(x) = L$, then $\lim_{n\to\infty} a_n = L$.

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

   (l) T / (F:) A bounded sequence converges.

   (m) T / (F:) A monotone sequence converges.

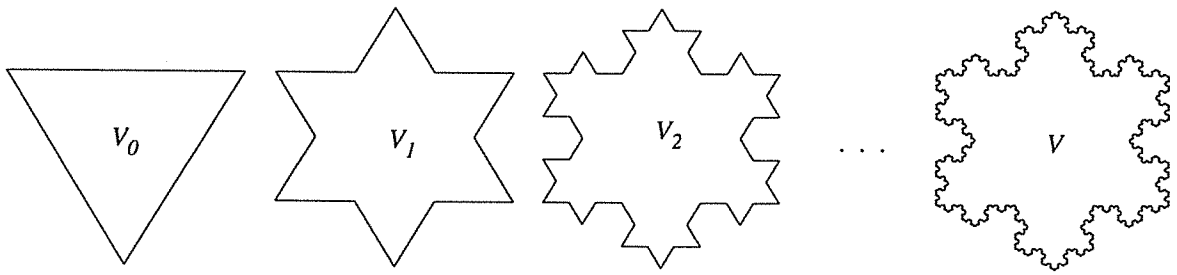
   (n) (T) / F: A bounded monotone sequence converges.

   (o) T / (F:) $\left(1 + \frac{1}{n}\right)^n \to 1$ as $n \to \infty$.

   (p) T / (F:) The 3rd partial sum of $\sum_{n=0}^{\infty} \frac{1}{2^n}$ is $S_3 = 1 + \frac{1}{2} + \frac{1}{4}$.

   (q) (T) / F: If the sequence $S_N = \sum_{n=0}^{N} a_n$ converges to 7, then ~~S_N~~ (typo) $\sum_{n=0}^{\infty} a_n$ converges.

   (r) T / (F:) For $P_0 > 0$, the sequence $\left\{P_0 \left(\frac{4}{3}\right)^n\right\}$ converges, i.e. the sequence of perimeters of the approximations of the von Koch Snowflake converges.



2. [1] Determine the limit of the sequence or state that the sequence diverges.

$$a_n = \arcsin\left(\frac{n^2 + 2n + 1}{1 - 2n^2}\right) \longrightarrow \arcsin\left(-\tfrac{1}{2}\right) = -\frac{\pi}{6}$$