Math 325. Quiz #6

(1) State the definition of a **subsequence** of a sequence $\{c_n\}_{n=1}^{\infty}$.

(2) TRUE OR FALSE, and either *give a 1–2 sentence explanation why it is true* or else *correct it*.

To prove that the formula $1 + \frac{1}{2} + \frac{1}{4} + \frac{1}{8} + \cdots + \frac{1}{2^n} = 2 - \frac{1}{2^n}$ holds for all $n \in \mathbb{N}$ by the Principle of Mathematical Induction, it is logically sufficient to show that

- $1 + \frac{1}{2} = 2 - \frac{1}{2}$, and
- For some natural number k, $1 + \frac{1}{2} + \frac{1}{4} + \frac{1}{8} + \cdots + \frac{1}{2^k} = 2 - \frac{1}{2^k}$.

(3) TRUE OR FALSE, and *justify* with a short proof or example:

If $\{a_n\}_{n=1}^{\infty}$ converges to 2, then $\{3a_{2n} - 1\}_{n=1}^{\infty}$ converges to 5.