MATH 351 Fall 2015 Must Get Correct Problems
Due by December 10 No more questions past Dec 4 (Except for #4)

(1) (Homework 3#11) Given the set
$$A = \left\{ 1 - \frac{n-1}{n+3} \,\middle|\, n \in \mathbb{N} \right\}.$$

Find $\inf A$ and then prove your result.

(2) (Homework 8) Prove or disprove: Let $(a_n) : \mathbb{N} \to \mathbb{R}$ be a convergent sequence then (a_n) is bounded.

(3) (Homework 8) Let $(a_n) : \mathbb{N} \to \mathbb{R}$ be the sequence whose terms are given by
$$a_n = \frac{3n-4}{n+2}.$$

Show that (a_n) converges.

(4) (Homework 12) Given a set $Y \subset \mathbb{R}$ and function $f : \mathbb{R} \to \mathbb{R}$,
   (a) Define the set $f^{-1}(Y)$
   (b) Let $A \subset \mathbb{R}$ be an open set. Show that f is continuous at every $a \in \mathbb{R}$ if and only if $f^{-1}(A)$ is open.