(1) Finish the proof of the theorem from class: If $f\colon A \to R^m$ is continuous where $a \subset R^n$, then for any open set $U \subset R^m$, there is an open set $V \subset R^n$ such the $f^{-1}(U) = V \cap A$.

(2) Finish the proof of theorem from class: Let $f\colon R^n \to R^m$ satisfies the following property.

    For any sequence $x_k \to p$ we have $f(x_k) \to f(p)$.

    Then f is continuous at p.

    Hint: Assume that f is not continuous at p and construct a sequence $x_k \to p$ such that $f(x_k) \nrightarrow f(p)$.

Extra Credit Problem (to be written up and submitted separately)
Let $A = \{x \in R^n | \text{such that } 1 \leq |x| \leq 2\}$ and $f\colon A \to R$ be a continuous function. Let $M = \sup_{a\in A} f(a)$ and $m = \inf_{a \in A} f(a)$. prove that $F(A) = [m, M]$.