Presentation problems for 2/22/13

Problem 1: Exercise 20.11 from the book.

Problem 2: Exercise 21.2 from the book.

Problem 3: Let $\prod_{\alpha\in J} X_\alpha$ have the product topology. Prove that if $f : A \to \prod_{\alpha\in J} X_\alpha$ is given by maps $f_\alpha : A \to X_\alpha$ for each α, so that

$$f(a) = (f_\alpha(a))_{\alpha\in J}$$

then f is continuous if and only if every f_α is continuous. (This is actually proved in the text. I want someone to read and understand the book's proof well enough to present it in their own words.)