Let X and Y be sets.

Definition 1. We say that X is a <u>subset</u> of Y, and denote $X \subset Y$, if for every $x \in X$ we have $x \in Y$.

Definition 2. We define the <u>Cartesian product</u> of X and Y, denoted $X \times Y$, to be the set

$$X \times Y = \{(x, y); \text{ where } x \in X, \ y \in Y\}.$$

Definition 3. A <u>function</u> f from X to Y, denoted $f : X \to Y$, is a rule that assigns for every $x \in X$ a unique element $f(x) \in Y$.

Let F be a field.

Definition 4. Let $\alpha \in F$. An element $\alpha' \in F$ is called an <u>additive inverse</u> of α if $\alpha + \alpha' = 0$.

Definition 5. Let $0 \neq \beta \in F$. An element $\beta' \in F$ is called a <u>multiplicative inverse</u> of β if $\beta \cdot \beta' = 1$.

Good Luck!