Lemma :-

If $r \in Q$ and $s \in Q'$, then

1. $r+s \in Q'$
2. $r \cdot s \in Q'$.

proof ① Suppose that $r+s \notin Q'$

$\Rightarrow r+s \in Q$.

since Q is field and $r \in Q$.

$\Rightarrow (r+s)-r = s \in Q$ c! with hypothesis $s \in Q'$.

$\therefore r+s \in Q'$.

proof ② (Exc).

Definition :- A complex number is an order pair where $a, b \in \mathbb{R}$, and we denoted by the set of all complex number by $\mathbb{C}$.

Definition :- Let (a,b), (c,d) be two complex numbers. then

1. $(a,b) = (c,d)$ iff $a=c$, $b=d$.
2. $(a,b)+(c,d) = (a+c, b+d)$.
3. $(a,b)\cdot(c,d) = (ac-bd, ad+bc)$