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Quiz #4
Mathematics 309a Abstract Algebra
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Let F be the set of all real-valued functions with domain $\mathbb{R}$ and let $\tilde{F}$ be the subset of F consisting of those functions that have a non-zero value at every point in $\mathbb{R}$.

A. $\tilde{F}$ is not a subgroup of F under function addition. Why?

B. $\tilde{F}$ is a subgroup of F under function multiplication.

i. Explain why $\tilde{F}$ is closed under function multiplication.

ii. Explain why the multiplicative identity of F is also in $\tilde{F}$.

iii. If $f \in \tilde{F}$ then the multiplicative inverse of f is also in $\tilde{F}$. Explain how to construct this multiplicative inverse and why it is in $\tilde{F}$.