

3. If R and S are fields, then either prove or disprove that $R \times S$ is a field.

4. Write out the addition and multiplication tables for $\mathbb{Z}_3 \times \mathbb{Z}_3$.

5. An element e of a ring R is called *idempotent* if $e^2 = e$. Find all idempotent elements of \mathbb{Z}_{12} .