

Problem Proposal #120

Greg Oman, University of Colorado, Colorado Springs

Problem. Let R be a commutative ring with identity $1 \neq 0$. Recall that if I and J are ideals of R , then the *product* of I and J is the ideal $IJ := \{i_1j_1 + \cdots + i_nj_n : i_k \in I, j_k \in J, n \in \mathbb{Z}^+\}$. Prove that R is a field if and only if for every ideal I and J of R , we have $IJ \in \{I, J\}$.