Universidad del Valle de Guatemala
Departamento de Matemática
Licenciatura en Matemática Aplicada

Estudiante: Rudik Roberto Rompich
Correo: rom19857@uvg.edu.gt
Carné: 19857

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Tarea 12

Problemas 1, 3 y 4, sección 3.5.

Sección 3.5

Problema 1 (Problema 1). *Let R be a ring with unit element, R not necessarily commutative, such that the only right-ideals of R are (0) and R. Prove that R is a division ring.*

Problema 2 (Problema 3). *Let J be the ring of integers, p a prime number, and (p) the ideal of J consisting of all multiples of p. Prove*

- *$J/(p)$ is isomorphic to J_p, the ring of integers $\operatorname{mód} p$.*
- *Using Theorem $3{,}5{,}1$ and part (a) of this problem, that J_p is a field.*

Problema 3 (Problema 4). *Let R be the ring of all real-valued continuous functions on the closed unit interval. If M is a maximal ideal of R, prove that there exists a real number $\gamma, 0 \leq \gamma \leq 1$, such that $M = M_\gamma = \{f(x) \in R \mid f(\gamma) = 0\}$.*