ma412-w24

Assignment WebWork7-Quotient_Rings due 03/13/2024 at 11:59pm EDT

Problem 1. (5 points)

Consider the quotient ring $\mathbb{Z}_5[x]/(x^2+4*x+3)$.

(a) This ring

- is a field
- is not a field and DOES NOT HAVE a non-zero nilpotent element
- is not a field and HAS a non-zero nilpotent element
- (b) In the answer box below, enter iul_{ζ} ili_{ζ} the inverse of x (as a degree 1 polynomial) if the ring is a field $\mathrm{i/li}_{\zeta}$ ili_{ζ} a degree 1 monic polynomial that is a zero divisor, if this ring is not a field $\mathrm{i/li}_{\zeta}$ $\mathrm{i/ul}_{\zeta}$

Answer(s) submitted:

- is not a field and DOES NOT HAVE a non-zero nilpotent element
- x+1

submitted: (correct)
recorded: (correct)

Problem 2. (10 points)

Find all elements $b \in \mathbb{Z}_{11}$ such that the quotient ring

$$\mathbb{Z}_{11}[x]/(x^2+9*x+b)$$

is a field.

Answer(s) submitted:

• 2,4,5,6,10

submitted: (correct)

recorded: (correct)

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