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 ¡ul¿ ¡li¿the inverse of x (as a degree 1 polynomial) if the ring is a field¡/li¿ ¡li¿a degree 1 monic polynomial that is a zero divisor, if this ring is not a field¡/li¿ ¡/ul¿

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)