Fundamental Concepts of Algebra

Spring 2015 Dr. Kracht

Name: ____

_Quiz Score: /20

Quiz 3: Friday, February 6, 2015

To receive full credit, show all work necessary to justify answers and all steps of solutions and derivations clearly, in logical sequence, using notation developed in class. Write proofs in complete sentences (with proper capitalization, punctuation, subject, verb, etc.). Partial credit will be given only for significant progress toward a solution.

1. (6pts) Complete each of the following definitions.

(a) For $a \in \mathbb{Z}$, the number ______ is said to be the *additive inverse* of *a* since

(b) The number _____ is said to be the *multiplicative identity element* of \mathbb{Z} since

2. (7 pts) Prove the following proposition.

Proposition. *If* $n \in \mathbb{Z}$ *, then* $0 \cdot n = 0$ *.*

Proof.

3. (7 pts) Explain why division by 0 is undefined.