Quiz 5

Student ID Number: Name _____

Math 173B, 1PM

Please justify all your answers February 14, 2019

Please also write your full name on the back

1. Let $\mathbb{F}$ be a field with characteristic p. Prove that for any $a, b \in \mathbb{F}$

$$(a+b)^p = a^p + b^p.$$

Recall that the characteristic of $\mathbb{F}$ *is the smallest nonnegative integer such that*

$$\underbrace{1+1+\cdots+1}_{p \text{ times}} = 0.$$

2. True or False? Explain

   (a) $\mathbb{F}_5$ contains an element whose square is $-1 \in \mathbb{F}_5$.

   (b) $\mathbb{Z}/9\mathbb{Z}$ is a finite field.