Quiz 3

Student ID Number: Name _____

Math 173A, 3PM

Please justify all your answers October 17, 2019

Please also write your full name on the back

1. Fill in the blank.

   (a) Given a prime p, g, and $g^a \pmod{p}$ for some $g \in \mathbb{F}_p^\times$ and integer a, the task of finding $a \pmod{p-1}$ is called the _____ problem.

   (b) Fix a prime p. An element $g \in \mathbb{F}_p^\times$ whose powers give every element of $\mathbb{F}_p^\times$ is called a _____ of $\mathbb{F}_p^\times$.

   (c) True or false? If $g^a \equiv g^b \pmod{p}$ for some prime p, $g \in \mathbb{F}_p^\times$ and integers a and b, then $a = b$.

2. Is 2 a primitive root modulo 7? How about modulo 13?