

Quiz 3

D Term, 2021

I affirm that I have not consulted my text, notes or any reference, paper or electronic, or any person once I opened and/or looked at this quiz.

Signature: _____

Show all work needed to reach your answers.

1. (1 points)

 $\mathbb{N} =$ _____

2. (12 points) Please complete the following multiplication table for
- \mathbb{Z}_7
- (multiplication mod 7).

\times	0	1	2	3	4	5	6
0	0	0	0	0	0	0	0
1	0	1	2		4		6
2	0	2		6		3	5
3	0		6		5		4
4	0	4		5	2	6	
5	0	5	3			4	2
6	0	6	5	4		2	1

3. (12 points) Please complete the following proof that the prime numbers (
- \mathbb{P}
-) are
- countably infinite*
- .

Proof (Contradiction):Suppose that the primes are finite, that is, suppose that $\mathbb{P} = \{p_1, p_2, \dots, p_n\}$ for some finite $n \in \mathbb{Z}^+$.