ZK Homework 4

1. Working with the following set of Integers S = {0,1,2,3,4,5,6}

What is

a) 4 + 4

b) 3 x 5

c) what is the inverse of 3 under

i) addition

ii) multiplication

Answers:

1. 4 + 4 ( mod 7 ) = 1
2. 3 x 5 ( mod 7 ) = 1
3. The inverse of a number in modular arithmetic depends on the operation:

i) The additive inverse of a number a is number b such that a + b ( mod 7 ) = 0. In our case it might be a = 3, b = 4.

ii) The multiplicative inverse of a number a is number b, such that a x b ( mod 7 ) = 1. Those exist only if a ( 3 in this case ) and modulus ( 7 ) in this case have no common denominator except 1. In this case it might be 5.