Exercise 1.4

Let F be a field and let n



1] Prove that | G | = 6



Solution:

We need to prove that there are 6 elements in the generalized linear group (where F2 is residue 0 mod 2)

Now we know that residue mod 2 are basically just 2 elements {0,1}

GL2(F2) ---group of all invertible 2 X 2 matrices with coefficients from F2 (the integers mod 2)

(a b The determinant of which is ad – bc which should be Non-Zero

c d) Now a, b, c and d can only be 0, 1

a = 0, d b = c = 1



a = 1, b = 0, c d = 1, either b = 0, d = 1



b = 1, d = 0

Thus, there are 6 elements (matrices) in GL2(F2) and so the order is 6

2] [ 1. 0. Is the identity element and therefore of the order 1.

0. 1]

* = and hence the order is 2



* =



= = and the matrix is of order 3



* = , matrix is of order 2

