# Prove that G={−1,1,i,−i} is a group under multiplication.

First need to show that G is indeed closed under the operation *

we have 1∗1=1 where 1∈G

we have −1∗−1=1 where 1∈G

we have 1∗−1=−1 where −1∈G and −1∗1=−1∈G

we have 1∗i=i and i∗1=i where i∈G

we have −1∗i=−i and i∗−1=−i where −i∈G

let k∈N then i2k=−1 where −1∈G

Finally let k∈N then we have i2k+1=−i where −i∈G

So, all possible outcomes from every combination of multiplication between any elements yields an element in G.

## Related posts:

1. Group
2. Undirected Graph and Incident Matrix
3. Prove the following by using the principle of mathematical induction for all n ∈ N, $1^3 + 2^3 + 3^3 + \ldots + n^3 = [n (n + 1)/2]^2$
4. Hasse diagram for the “less than or equal to” relation on the set S= { 0,1,2,3,4,5}
5. SET
6. Mathematical induction

7. Relation
8. Net 34
9. prove that- AX(B∩C) = (AXB) ∩ (AXC)
10. Prove that- A∩(B∪C) = (A∩B) ∪ (A∩C)
11. prove that – (A∩B)X(C∩D) = (AXC)∩(BXD)
12. Show that- (P∩Q)X(R∩S) = (PXR)∩(QXS)
13. Binary operations
14. Algebraic structure
15. Show that (…, -4, -3, -2, -1, 0, 1, 2, 3, 4,…} is group
16. Show that a*b=b*a
17. if a*c = c*a and b*c = c*b, then (a*b)*c = c*(a*b)