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 $1 \in G$

we have $-1*-1=1$ where $1 \in G$

we have $1*-1=-1$ where $-1 \in G$ and $-1*1=-1 \in G$

we have $1*i=i$ and $i*1=i$ where $i \in G$

we have $-1*i=-i$ and $i*-1=-i$ where $-i \in G$

let $k \in N$ then $i2k=-1$ where $-1 \in G$

Finally let $k \in N$ then we have $i2k+1=-i$ where $-i \in G$

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 $n \in N$, $1^3 + 2^3 + 3^3 + \ldots + n^3 = [n (n + 1)/2]^2$
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)