

Answer on Question #58450 – Math – Abstract Algebra

Question

Do the even integer form a group w.r.t. addition?

Solution

The set of even number (including zero and negative even numbers) is a subset of the integers. It is a group with respect to addition because it satisfies all group axioms:

1. The sum of even integers is also even integer (the closure under addition)
2. For all even integers a , b and c , $(a + b) + c = a + (b + c)$. This property is known as associativity.
3. If a is any even integer, then $0 + a = a + 0 = a$. Zero is called the identity element of addition because adding it to any integer returns the same integer.
4. For every even integer a , there is an integer b such that $a + b = b + a = 0$. The integer b is called the inverse element of the integer a and is denoted by $-a$.