Answer on Question #58440 – Math – Abstract Algebra

Question

Do the odd integers form a group w.r.t. addition?

Solution

To qualify as a group, the set and operation, (*G*, •), must satisfy four requirements known as the *group axioms*:

<u>Closure</u>

For all *a*, *b* in *G*, the result of the operation, *a* • *b*, is also in *G*.

<u>Associativity</u>

For all *a*, *b* and *c* in *G*, (*a* • *b*) • *c* = *a* • (*b* • *c*).

<u>Identity element</u>

There exists an element *e* in *G*, such that for every element *a* in *G*, the equation *e* • *a* = *a* • *e* = *a* holds. Such an element is unique (see below), and thus one speaks of *the* identity element.

<u>Inverse element</u>

For each *a* in *G*, there exists an element *b* in *G* such that *a* • *b* = *b* • *a* = *e*, where *e* is the identity element.

Let's see the odd integers: if one odd integer add to another odd integer we will get even integer, then first axiom does not work for odd integers. Result of addition is not in set of odd integers.

Answer: NO.