Question: Is set of odd numbers with binary operations (+), ie $\langle O, + \rangle$ an abelian group?

⇒ solution: $O = \{\ldots -3, -1, 1, 3, 5, 7, 9, 11, 13, 15 \ldots\}$

1. closure: if $a, b \in O$ then $a+b \in O$.

Let $a = 3$, $b = 5$; the $3+5 = 8$ not $\in O$

so, condition ~~not~~ fails this requirement

2. Indentity element: 0 is even number so, in $e+a \in a$ is work out.

3. Associative: ~~a+b~~ if $\forall a, b, c \in a$ then.

$a+(b+c) = (a+b)+c \in a$.

Let, $a = 3$, $b = 5$, $c = -5$

then, $3+(5-3) = (3+5)-3 = 5 \in a$ O

so, ∴ Here condition is satisfy.

4. Inverse Element: if $a, a' \in O$ and $(a+a') = e \in O$.

Let $a = 3$; $a' = -3$; $a+a$ $3-3 = 0 \in O$

this O pass this requirement.

5. communicative: if $\forall a, b \in O$ then $(a+b) = b+a \in O$

so Let $a=5, b=7$; $5+7 = 7+5 = 12$ not $\in O$

this condition not satisfy.

Here given odd number set is not an abelian because it is not pass all the con of condition of abelian.