4. For every natural number, we can present them in one of the following forms:

① ~~$4k-3$ for $k \in \mathbb{N}$~~ $4n$ for $n \in \mathbb{Z}$

② ~~$4k-2$ for $k \in \mathbb{N}$~~ $4n+1$ for $n \in \mathbb{Z}$

③ ~~$4k-1$ for $k \in \mathbb{N}$~~ $4n+2$ for $n \in \mathbb{Z}$

④ ~~$4k$ for $k \in \mathbb{N}$~~ $4n+3$ for $n \in \mathbb{Z}$

For case 1 and case 3, $4n = 2(2n)$ and $4n+2 = 2(2n+1)$ are even natural numbers.

For case 2 and case 4, $4n+1 = 2(2n)+1$ and $4n+3 = 2(2n+1)+1$ are odd natural numbers.

So every odd natural numbers is one of the forms $4n+1$ or $4n+3$, where n is an integer.