4.

Proof: proof by induction.

Let odd natural number be $2x-1$ where x is natural number.

When $x=1$, for odd natural number 1, it follows the form $4n+1$ when $n=0$ (n is an integer)

Assume the statement holds for odd natural number $2x-1$,

i.e., $2x-1$ is of one of the forms $4n + 1$ or $4n + 3$ where n is an integer

Then for odd natural number $2(x+1)-1$, by the induction hypothesis, we have $2(x+1)-1=2x+1$ is of one of the forms $4n + 3$ or $4(n +1) +1$

The statement has been proved by induction.