

Test Flight Problem Set 4

Proposition: Every odd natural number is one of the forms $4n + 1$ or $4n + 3$ where n is an integer

Proof by considering cases

Clearly every odd natural number is of the form $2k + 1$ for some integer k

Case 1: k is even

$k = 2n$ for some integer n , so that $2k + 1 = 4n + 1$

Case 2: k is odd

$k = 2n + 1$ for some integer n , so that $2k + 1 = 4n + 2 + 1 = 4n + 3$

Since a natural number is either odd or even, there are no other cases and the proof is complete