

Theorem (1.6.18). *Let n be an integer. If $3n + 2$ is even, then n is even.*

Proof. By the contrapositive. Suppose n is odd. By the definition of odd numbers there exist an integer k such that $n = 2k + 1$. We have $3(2k + 1) + 2 = 2(3k + 2) + 1$. Since $3k + 2$ is an integer $3n + 2$ is odd by definition. ■