

1. $f(x) = ax^2 + bx + c$, where a, b, c are known integers. For odd number m , $am^2 + bm + c$ is odd number and c is also odd number. Please prove for $ax^2 + bx + c = 0$, x would not be an odd number.
2. a, b, c, d are 4 natural numbers, and $a + b + c + d = 1989$, please prove $a^3 + b^3 + c^3 + d^3$ are not even number.
3. a, b are two integers and b would not equal 0. If integer q , then $a = b * q$, then we can say a is divisible by b , written as $b|a$. Now we know $7|(13x + 8y)$, please prove $7|(9x + 5y)$.
4. We know m and n are odd numbers. When $4|k$, please prove $8|(m^k - n^k)$.
5. 17 classmates are having a meeting and shake hands. Please prove it is impossible that everyone shakes hands with 3 and only 3 people.