Question 3

Teng Long

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proposition: For any integer n, the number $n^2 + n + 1$ is odd.

proof: we prove by the fact that multiply an odd integer by an even integer results a even number.

1.the proposition is equal to –For any integer n, the number $n^2 + n$ is even (as an even number plus one equal to an odd number)

2. $n^2 + n = n(n + 1)$

3. for any integer n, and n + 1. If n is odd, then n + 1 is even. if n is even then n + 1 is odd. there is no other situation.

4. multiply an odd number by an even number give an even number.

5. therefore $n(n + 1) = n^2 + n$ is even

6. **conclusion:** $n^2 + n + 1$ is odd.