1. Consider the statement, if gcd(a,b) = 1 then either a or b must be prime. If this is a True statement then prove it, and if it is False give a counter example.

2. What are the possible remainders of $[n^3 \bmod 9]$ for all positive values of n. In other words, what are the possible values of x in: $n^3 \equiv x \ (mod\ 9)$.

3. Solve: $4x^2 \equiv 3 \ (mod\ 9)$.

4. Find the value of (2021^{2021} mod 21). Show all the steps.

5. Use the Chinese Remainder Theorem to solve the system of congruences:
   $x \equiv 2 \bmod 9$
   $x \equiv 5 \bmod 26$
   $x \equiv 3 \bmod 55$
   $x \equiv 6 \bmod 49$