Tutorial - 4

1. (a) Given $a = 84$ and $b = 320$, find gcd (a, b) and the values of s and t.

    (b) Given $a = 161$ and $b = 28$, find gcd (a, b) and the values of s and t.

    (c) Given $a = 17$ and $b = 0$, find gcd (a, b) and the values of s and t.

    (d) Given $a = 0$ and $b = 45$, find gcd (a, b) and the values of s and t.

2. Find the result of 6^{10} mod 11.

3. Find the result of 3^{12} mod 11.

4. We know that 61 is a prime, let us see if it passes the Miller-Rabin test?

5. (a) Show that the inverse of 5 modulo 101 is 5^{99} .

   (b) Use repeated squaring to simplify 5^{99} (mod 101).

   (c) Hence solve the equation $5x \equiv 31$ (mod 101).