```java
public class rsa{
    // notation as in slides and notes
    // checks gcd of a and b is 1
    //
   public static  boolean checkgcd(long a, long b)
    {
        for(long j = 2 ; j < b; j++)
            {
                if((a%j) == 0 && (b % j)==0)
                    {
                        return false;
                    }
            }
        return true;
     }

    public static void main(String a[])
    {
        long p =1223 , q = 1987;
        long N = p*q, e = 948047;

        if(checkgcd(e,(p-1)*(q-1))==false)
            {
                System.out.println("problem - gcd not equal to one");
                System.exit(0);
            }

        long   m = 1070777; // Alice's message
        long c = 1;
            // c = m^e mod N  - 2.2 part 4
            for(long k = 1; k <=e;k++)
                {
                    c = c*m;
                    c = c%N;
                }
                System.out.println("c is " + c);

                // c is sent to Bob, Eve knows c
                // Bob  find's  d, 2.2 part 5
                long  d  = 1;
                for(long z = 1 ; z <=(p-1)*(q-1); z++)
                    {
                        if((e*z-1)%((p-1)*(q-1)) == 0)
                            {
                                // found d
                              System.out.println("d is " + z);
                              d = z;
                             break;
                            }
                    }
                // d now known

                long variable = 1;
                   // wish   c^d mod N
            for(long k = 1; k <=d;k++)
                {
                    variable = variable*c;
                    variable = variable%N;
                }
            System.out.println("variable= " + variable + " m=" +m);
            // variable matches to m and all is well



    }
}
```