



Problem 3. «Hidden RSA»

Bob has learned about the public-key cryptography and now anyone can send a secret message to him. The message is encoded by a nonnegative integer x which has at most 70 digits in the decimal representation. To send a message for Bob, one has to enter it on his [webpage](#). After the message is entered, it is immediately encrypted using RSA. The encryption result is

$$\text{Encr}(x) = x^e \bmod n,$$

where n is a modulus (product of two distinct odd primes p and q) and e is a public exponent (coprime with $p - 1$ and $q - 1$). Bob is afraid of hackers and does not disclose either n or e (even though this contradicts the usual usage of the RSA cryptosystem).

Victor has intercepted the encrypted message

$$y = 71511896681324833458361392885184344933333159830863878600189212073777582178173,$$

which Alice has sent to Bob.

Help Victor to decrypt y . You can enter any allowed message x on the Bob's [website](#) and receive in response the corresponding ciphertext $\text{Encr}(x)$.