

# RSA - encryption and decryption

Given  $K_p = (e, n)$  and  $K_s = (d, n)$

➡ Encryption :  $E_{kp}(m) = m^e \bmod n = c$

➡ Decryption :  $D_{ks}(c) = c^d \bmod n = m$

➡  **$(m^e)^d \bmod n = (m^d)^e \bmod n = m$**

# The security of RSA

**RSA Labs Challenge** : factoring primes set

Key length	Year	Time
140	1999	1 month
155	1999	4 months
160	2003	20 days
200	2005	18 months
768	2009	3 years

Challenges are no longer active