In-Class Worksheet

Discrete Math & Functional Programming— CSCI 054— Spring 2024
Instructor: Osborn

Consider the following relations. Is each one reflexive, symmetric, and/or transitive? If it's all three and therefore an equivalence relation, describe the equivalence classes.

1. S = all juniors and seniors currently enrolled at Pomona. $(x, y) \in R_1$ if they share a major.

2. $S = \mathbb{Z}$. $(x, y) \in R_2$ if $x = y$.

3. $S = \{1, 2, 3, 4, 5\}$. $R_3 = \{(1, 5), (2, 2), (2, 4), (4, 1), (4, 2)\}$.

Let S be the set of all students currently enrolled at Pomona. Define an equivalence relation on S that isn't one of the ones discussed in lecture on Monday.

Consider the relation $R = \{(1, 5), (2, 2), (2, 4), (4, 1), (4, 2)\}$ on $\{1, 2, 3, 4, 5\}$. What is the reflexive closure? What is the symmetric closure? What is the transitive closure?

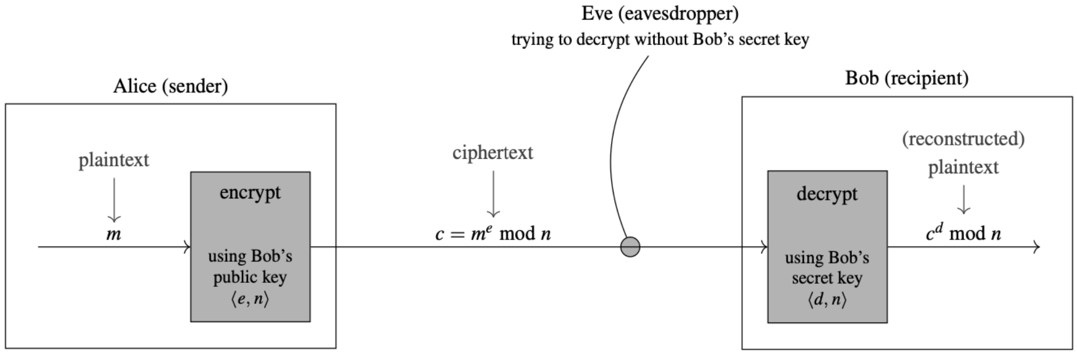

Figure 7.27 A schematic of the RSA cryptosystem, where $n = pq$ and $de \equiv_{(p-1)(q-1)} 1$, for prime numbers p and q.

Given $p = 3$ and $q = 13$, what are:

- n
- $\phi(n)$
- e
- d
- public key:
- private key:

What do you get if you encrypt 10?