

Math 2001: PHW10

1. From the book do:

11.2. 4, 14

11.3. 2, 10, 12

11.5. 4, 6

2. Let A be a set with n elements.

(a) How many reflexive relations are there on A ?

(b) How many symmetric, reflexive relations are there on A ?

(c) How many equivalence relations are there of A , if $n = 5$?

3. Let p be a prime number.

(a) Show that

$$\binom{p}{j} \equiv 0 \pmod{p}$$

unless $j \in \{0, p\}$.

(b) Deduce

$$(x + y)^p \equiv x^p + y^p \pmod{p}.$$

Hint: Think binomial theorem.