## Math 2001: PHW10

1. From the book do:

5B. 24
11.1. 4,14
11.2. $2,10,12$
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

$$
\binom{p}{j} \equiv 0(\bmod p)
$$

unless $j \in\{0, p\}$.
(b) Deduce

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

Hint: Think binomial theorem.

