Math 2001: PHW10

1. From the book do:

   11.1. 4, 14

   11.2. 2, 10, 12

   11.4. 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

   $$\binom{p}{j} \equiv 0 (\text{mod } p)$$

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

   (b) Deduce

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

   Hint: Think binomial theorem.