

## Math 475 Exercises 2

Feb 8, 2010

1. Let  $S$  be an  $n$ -element set and let

$$R = \{(A, B) : A \subseteq B\}$$

(that is  $R$  is the order relation  $\subseteq$  on  $S$ ). Show that  $|R| = 3^n$ . There are two ways to do this: the first is to use the binomial theorem and the second is similar to the combinatorial argument we gave to show the number of subsets of  $S$  is  $2^n$ .

2. For an ordinary poker (5-card) hand, find the probability of
  - a. The hand has 2 pairs (but not 4 of a kind and not a full house).
  - b. The hand is a full house.