Lecture #36 12/02/2016

Ex 1: Bob has 20 different dress shirts in his wardrobe

(a) In how many ways can he select 7 shirts to pack for his business trip?

(b) In how many ways can he select 5 of those 7 dress shirts: one - for Monday, ..., one - for Friday?

Answer: (a) $_{20}C_7$, (b) $_7P_5$

Ex 2: See Ex 4 from Lecture 35.

Ex 2': Same q-s as in Ex 2, but when tossing a coin 9 times instead of 3.

Ex 3: Bob rolls dice twice. Find the probability of the following events:

(a) E_1: "Both dice show 1 or 2 dots at the end"

(b) E_2: "At least one dice has 1 or 2 dots".

Answer: (a) $1/9$, (b) $5/9$.

Def: Two events are said to be independent events if the occurence of one event does not affect the probability of the occurence of the other event.

! When events E and F are independent, the probability that both occur is the product of their respective probabilities

$$\boxed{Pr(E \text{ and } F) = Pr(E) \cdot Pr(F)}$$

↗ the multiplication principle for independent events

Ex 5 (Exercise 16.3.49) An honest coin is tossed 10 times in a row. The result of each toss (H or T) is observed. Find the probability of the event E = "a T comes up at least once"

► $1 - 1/2^{10} = 1023/1024$ ■ Idea: $1/2^{10}$ is the probability of the complementary event.

Def: Let E be an arbitrary event. If F denotes the number of ways the event E can occur, while U denotes the number of ways that E does not occur, then the
- odds of the event E are given by F:U
- odds against the event E are given by U:F.

Note: $Pr(E) = \frac{F}{F+U}$

Ex4: Find the odds of an event E with $Pr(E) = \frac{7}{11}$.