1. If two standard six-sided dice are rolled (one white, ⚀, ⚁, ⚂, ⚃, ⚄, ⚅; one black ⚀, ⚁, ⚂, ⚃, ⚄, ⚅), what is the probability that ⚁ or ⚃ or both are rolled?

Why isn't it (6+6)/36? Why isn't it (6+6+1)/36 if both are allowed?

FWIW: $C(n,k) = \frac{n!}{(n-k)!\times k!}$ counts the number of ways of choosing k distinct objects from a set of n objects if the ordering of the choosing does not matter. For instance $C(7,3) = \frac{7\times6\times5\times4\times3\times2\times1}{4\times3\times2\times1\times3\times2\times1} = \frac{7\times6\times5}{3\times2\times1} = 35$ ways to choose 3 things out of 7.

2. What is the probability of getting at least 2 aces if you draw 3 cards from a standard 52 card deck?

What if you draw 4 cards? 5 cards? How does the probability change if your goal is still just 2 aces? How many do you need to draw to guarantee 2 aces? How many to have a 50-50 shot at 2 aces?

3. If $P(E) = 40\%$, $P(F) = 55\%$, and $P(E \cup F) = 85\%$, then what is $P(E \cap F)$?

4. What is $P(E - F)$?

Why don't we subtract 55% from 40% ($P(E) - P(F) = 40\% - 55\%$)?

5. What is the probability of rolling at least one ⚄ if you roll the die 3 times?

What about 4 times? 5 times? How does the probability change with the number of rolls if the goal remains just on ⚄? How many times do you need to roll to get a 90% chance? How many to guarantee it?

6. Suppose 40% of people like the letter E, 55% of people like the letter F, but 15% of people don't like either letter.

(a) What is the probability a random citizen likes at least one of the letters?

(b) What is the probability a random citizen likes both of the letters?

(c) What is the probability a random citizen likes E but not F?

7. The noble knight, Vey, asked his knightly buddies how many horses they had. 30% had 1 or fewer steeds, 40% has 2 or fewer steeds, 10% had 4 or more steeds

(a) What is the probability a random knight had 3 or fewer steeds?

(b) What is the probability a random knight had exactly 3 steeds?

(c) What is the probabilty a random knight had exactly 2 steeds?