What is the probability of in a magic trick having 5 envelopes, we will call 4 winners and 1 a loser. What's the probability of selecting a winner then without replacement selecting another winner, then another and another. Until you are left with the unselected "loser"? And what formula would you use?

Solution.

By classical definition of probability the required formula is $P(x) = A/B$, where *A* - the remaining amount of winners, *B* – the remaining amount of envelopes, *P(x)* – the probability of selecting a winner on *x–th* step. So, on first step we have

$$P(1) = \frac{4}{5} = 0{,}8.$$

One envelope was selected, because of on the second step,

$$P(2) = \frac{3}{4} = 0{,}75$$

And so on

$$P(3) = \frac{2}{3} = 0,(6)$$

$$P(4) = \frac{1}{2} = 0{,}5$$

Answer: 0,8; 0,75; 0,(6); 0,5.