Úlohy ke cvičení

Věta 1 (Binomická věta)**.** $(x+y)^n = \sum_{k=0}^{n} \binom{n}{k} x^{n-k} y^k$.

Úloha 1. Dokažte kombinatorickou úvahou:

1. $\binom{n-1}{k-1} + \binom{n-1}{k} = \binom{n}{k}$
2. $\sum_{k=0}^{n} \binom{n}{k} = 2^n$
3. $\sum_{k=0}^{n} (-1)^k \binom{n}{k} = 0$
4. $\sum_{k=0}^{r} \binom{n}{k}\binom{m}{r-k} = \binom{m+n}{r}$
5. $\sum_{k=r}^{n} \binom{k}{r} = \binom{n+1}{r+1}$
6. $\sum_{k=0}^{n} k\binom{n}{k} = n2^{n-1}$