IDENTITĂȚI ÎN COMBINATORICĂ

Arătați că:

1) $C_n^k = C_n^{n-k}$ și $C_n^k = \frac{n}{k} C_{n-1}^{k-1}$

2) $C_n^k = C_{n-1}^k + C_{n-1}^{k-1}$

3) $\frac{C_n^k}{C_n^k + C_n^{k+1}} = \frac{k+1}{n+1}$

Prof. Ovidiu Bădescu

Arătați că:

$$\frac{C_n^k}{C_n^k + C_n^{k+1}} = \frac{k+1}{n+1}$$

$$E_1)\ M_\Delta = \frac{C_n^k}{C_n^k + C_n^{k+1}} = \frac{\frac{n!}{k!(n-k)!}}{\frac{(k+1)n!}{k!(n-k)!} + \frac{(n-k)n!}{(k+1)!(n-k-1)!}} =$$

$$= \frac{\frac{n!}{k!(n-k)!}}{\frac{n!(k+1)+n!(n-k)}{(k+1)!(n-k)!}} = \frac{n!}{k!(n-k)!} \cdot \frac{k!(k+1)(n-k)!}{n!(k+1+n-k)} \Rightarrow$$

$$E_2)\ M_\Delta = \frac{k+1}{n+1}$$

Prof. Ovidiu Badescu