

Zadatak 10. Dokaži da za svaki prirodni broj n vrijedi identitet:

$$1) \binom{n}{0} + \binom{n}{1} + \binom{n}{2} + \dots + \binom{n}{n} = 2^n;$$

$$2) \binom{n}{0} - \binom{n}{1} + \binom{n}{2} - \dots + (-1)^n \cdot \binom{n}{n} = 0.$$

Rješenje.

1) U formulu za $(a+b)^n$ stavimo $a=b=1$ i dobijemo

$$2^n = (1+1)^n = \binom{n}{0} + \binom{n}{1} + \binom{n}{2} + \dots + \binom{n}{n};$$

2) U formulu za $(a+b)^n$ stavimo $a=1, b=-1$ i dobijemo

$$0 = (1-1)^n = \binom{n}{0} - \binom{n}{1} + \binom{n}{2} - \dots + (-1)^n \cdot \binom{n}{n}.$$