Progresii

1. Spunem ca sirul de numere $\mathbf{a_1, a_2, a_3, \ldots, a_n, \ldots}$ este o **progresie aritmetica** daca pentru orice $\mathbf{k \geq 2}$ avem $\mathbf{a_{k+1} = a_k + r}$, unde **r** este un numar constant, $\mathbf{r \neq 0}$, numit **ratie.**

2. <u>Proprietatile progresiei aritmetice</u>:

a) $\mathbf{a_n = \frac{a_{n-1} + a_{n+1}}{2}}$, $\forall$ $\mathbf{n \geq 2 \Leftrightarrow a_n - a_{n-1} = a_{n+1} - a_n}$, $\forall$ $\mathbf{n \geq 2}$,

b) $\mathbf{a_n = a_1 + (n-1)r}$, $\forall$ $\mathbf{n \geq 2}$,

c) $\mathbf{a_k = a_p + (k-p)r}$, $\forall$ $\mathbf{k, p \geq 2}$,

d) $\mathbf{S_n = \frac{(a_1 + a_n)n}{2}}$, $\forall$ $\mathbf{n \geq 2}$ unde $\mathbf{S_n = a_1 + a_2 + a_3 + \ldots + a_n}$ (suma primilor n termeni ai progresiei aritmetice**).**

3. Spunem ca sirul de numere $\mathbf{b_1, b_2, b_3, \ldots, b_n, \ldots, (b_n \neq 0)}$, este o **progresie geometrica** daca pentru orice $\mathbf{k \geq 2}$ avem $\mathbf{b_{k+1} = b_k \cdot q}$, unde **q** este un numar constant, $\mathbf{q \neq 0}$, numit **ratie.**

4. <u>Proprietatile progresiei geometrice</u>:

a) $\mathbf{b_{n+1}/b_n = b_n/b_{n-1}}$, $\forall$ $\mathbf{n \geq 2 \Leftrightarrow b_n^2 = b_{n-1} \cdot b_{n+1}}$, $\forall$ $\mathbf{n \geq 2}$,

b) $\mathbf{b_n = b_1 \cdot q^{n-1}}$, $\forall$ $\mathbf{n \geq 2}$,

c) $\mathbf{b_k = b_p \cdot q^{k-p}}$, $\forall$ $\mathbf{k, p \geq 2}$,

d) $\mathbf{S_n = \frac{b_n q - b_1}{q-1} = \frac{b_{n+1} - b_1}{q-1}}$, $\mathbf{q \neq 1}$, $\forall$ $\mathbf{n \geq 2}$, unde $\mathbf{S_n = b_1 + b_2 + b_3 + \ldots + b_n}$ (suma primilor n termeni ai progresiei geometrice).