Zadatak 14. Napiši prvih pet članova niza (a_n) zadanog rekurzivnim formulama:

1) $a_n = a_{n-1} + 1,\ a_1 = 1;$

2) $a_n = a_{n-1} + n,\ a_1 = 1;$

3) $a_n = \dfrac{a_{n-1} + a_{n-2}}{2},\ a_1 = 1,\ a_2 = 2;$

4) $a_n = \sqrt{a_{n-1}a_{n-2}},\ a_1 = 1,\ a_2 = 2.$

Rješenje. **1)** $a_n = a_{n-1} + 1,\ a_1 = 1;$

$a_1 = 1, \quad a_2 = a_1 + 1 = 1 + 1 = 2, \quad a_3 = a_2 + 1 = 2 + 1 = 3,$

$a_4 = a_3 + 1 = 3 + 1 = 4, \quad a_5 = a_4 + 1 = 4 + 1 = 5;$

2) $a_n = a_{n-1} + n,\ a_1 = 1;$

$a_1 = 1, \quad a_2 = a_1 + 2 = 1 + 2 = 3, \quad a_3 = a_2 + 3 = 3 + 3 = 6,$

$a_4 = a_3 + 4 = 6 + 4 = 10, \quad a_5 = a_4 + 5 = 10 + 5 = 15;$

3) $a_n = \dfrac{a_{n-1} + a_{n-2}}{2},\ a_1 = 1,\ a_2 = 2;$

$$a_1 = 1, \quad a_2 = 2, \quad a_3 = \frac{a_2 + a_1}{2} = \frac{2+1}{2} = \frac{3}{2},$$

$$a_4 = \frac{a_3 + a_4}{2} = \frac{\frac{3}{2} + 2}{2} = \frac{7}{4}, \quad a_5 = \frac{a_4 + a_3}{2} = \frac{\frac{7}{4} + \frac{3}{2}}{2} = \frac{13}{8};$$

4) $a_n = \sqrt{a_{n-1}a_{n-2}},\ a_1 = 1,\ a_2 = 2.$

$$a_1 = 1, \quad a_2 = 2, \quad a_3 = \sqrt{a_2 a_1} = \sqrt{1 \cdot 2} = \sqrt{2},$$

$$a_4 = \sqrt{a_3 a_2} = \sqrt{\sqrt{2} \cdot 2} = \sqrt[4]{2^3}, \quad a_5 = \sqrt{a_4 a_3} = \sqrt{\sqrt[4]{2^3} \cdot \sqrt{2}} = \sqrt[8]{2^5}$$