

نام خانوادگی حسین کهنه
 امتحان تشریحی لایف ساره
 کلاس A

الف) $a_1 = 5, d = 4 \quad t_n = 5 + (n-1)4$

ب) $t_{10} = 5 + (10-1)4 = 41$

الف) $a_1 = 4, d = 4 \quad t_n = 4 + (n-1)4$

$S_n = \frac{n}{2} (2a_1 + (n-1)d) = 5(12 + 34) = 240$

$S_n = \frac{n}{2} (2a_1 + (n-1)d)$

ب) $a_{29} + a_{30} + a_{31} + a_{32} = S_{32} - S_{28} \Rightarrow 14(12 + 124) - 14(12 + 108) = 494$

$d = 1 - \sqrt{3} \quad a_{22} = a_1 + 21d \quad a_{20} = a_1 + 19d$

$a_{22} - a_{20} = a_1 + 21d - (a_1 + 19d) = a_1 + 21d - a_1 - 19d = 2d$

$2d = -2(1 - \sqrt{3}) = 2\sqrt{3} - 2$

در دنباله a_n داریم: $y = \frac{x+1}{2}$

در دنباله b_n داریم: $2 = \frac{x+y}{2} \Rightarrow x+y = 4$

$\begin{cases} y = 2x + 1 \\ 4 = x + y \Rightarrow y = 4 - x \end{cases} \Rightarrow 2x + 1 = 4 - x \Rightarrow 3x = 3 \Rightarrow x = 1, y = 3$

الف) $d = 3 \quad 2a_2 = a_1 + a_3 \Rightarrow 4x - 2 = \frac{4x + 12x - 4}{2} \Rightarrow 4x - 2 = 8x - 2 \Rightarrow 4x = 4 \Rightarrow x = 1$

$a_4 = a_2 + d \Rightarrow a_4 = 4 \times \frac{1}{2} + 3 = 5$

$$a_n = 3 + (n-1)2 = 2n+1$$

$$b_n = 4 + (n-1)3 = 3n-1$$

$$a_n \cap b_n = 4n-1$$

$$a_{10} = 3 + (10)2 = 23$$

$$4n-1 \leq 23 \Rightarrow n \leq 6 \rightarrow \boxed{\text{جمله ششم}}$$

$$3a_p = 21 \Rightarrow a_p = 7, \quad 3a_p = 105 \Rightarrow a_p = 35$$

$$d = a_p - a_r = 35 - 7 = 28$$

$$a_1 = a_p - d = 7 - 28 = -21$$

$$a_p - a_r + a_1 = a_1 + d = a_p = 7$$

$$\frac{a_p - a_r + a_1}{a_1} = \frac{7}{-21} = -\frac{1}{3}$$

$$3a_p = 105 \rightarrow a_p = 35$$

$$3a_1 + 3d = 105 \rightarrow 3(a_1 + d) + 3d = 105$$

$$a_1 = a_p - d = 35 - 28 = 7$$

$$a_r + a_5$$

$$3d = 105 \rightarrow d = 35$$

$$a_n = 3 + (n-1)2 \Rightarrow a_{10} = 3 + (10-1)2 = \boxed{21}$$

$$S_9 = 9a_5, \quad 9S_p = 9(3a_p) = 27a_p$$

$$S_9 = 9S_p \Rightarrow 9a_5 = 27a_p \rightarrow a_5 + 4d = 3a_p \Rightarrow a_1 + 4d = 3a_1 + 3d \Rightarrow d = 2a_1$$

$$\frac{a_{10}}{a_5} = \frac{a_1 + 9d}{a_1 + 4d} = \frac{a_1 + 18a_1}{a_1 + 8a_1} = \frac{19a_1}{9a_1} = \boxed{19/9}$$

$$b_f = a_f = \frac{a_1 + 11d}{2} \Rightarrow a_f = \frac{3a_1 + 11d}{2} = 13$$

$$b_f = 13 = a_1 + (f-1)d = 3 + 3d \Rightarrow 3d = 10 \Rightarrow d = 10/3$$

$$13 = 3 + (n-1) \times (10/3) \Rightarrow 10 = (n-1) \times (10/3) \Rightarrow n = 4$$

$$\text{جمله اول} = (n-1) - 1 = (4-1) - 1 = \boxed{2}$$