نام و نام خانوادگی ....ساطع اصغری.......... پاسخنامه تشریحی تکلیف شماره ...۱۷... کلاس .... A جمع‌بندی ....

۲۰

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$\{1\}, \{2,3,4\}, \{5,6,7,8,9\}$

رقم آخر دسته نهم ← فرمول: $n^2 \Rightarrow 9^2 = 81$

فرمول رقم اول ← $(n-1)^2+1$ ← دسته دوم: $(2-1)^2+1=2$

دسته نهم: $(9-1)^2+1=65$

واسطه حسابی: $\frac{a+b}{2} \Rightarrow \frac{65+81}{2} = 73$

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$\{1,2,3\}, \{4,5,\dots,12\}, \{13,14,\dots,39\}, \{40,\dots,120\}, \{121,\dots,363\}$ دسته ۵

$\frac{121+363}{2} \to 3\times121 = \frac{484}{2} = 242$

۲ ✓

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$2k \rightsquigarrow n=9,6,3,0 \rightsquigarrow k=0,1,2,\dots$

$-2k+4 \rightsquigarrow n=1,4,7 \rightsquigarrow k=0,1,2,\dots$

$\left[\frac{n}{k+2}\right]+\underset{-2}{a} \rightsquigarrow n=2,5,8 \rightsquigarrow k=0,1,2,\dots$

$a_0 = 2^0 = 1$

$a_1 = -2(0)+4 = 4$

$*a_2 = \left[\frac{2}{0+2}\right]+a = \underset{1-2=-1}{1+a}$

$a_3 = 2^1 = 2$

$a_4 = -2(1)+4 = 2$

$*a_5 = \left[\frac{5}{1+2}\right]+a = 1+\underset{-2}{a} = -1$

$a_6 = 2^2 = 4$

$a_7 = -2(2)+4 = 0$

$*a_8 = \left[\frac{8}{2+2}\right]+a \to 2+a$

$a_9 = 2^3 = 8$

$S_{10} = 1+4+1+a+2+2+1+a+4+0+2+a+8 = 25+3a = 19$

$3a = -6 \rightsquigarrow a = -2$

۲ ✓

$a_2+a_5+a_8+\dots+a_{29} = (-1)+(-1)+(0)+(0)+\dots+(0) = \boxed{-2}$

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$*a = \frac{1}{70} \times -14 = -0.2$

درجه ۲ «$a_n = an^2+bn+c$»

$a_5 = a(5)^2+5b+c = 14 \rightsquigarrow (25a+5b+c=14)-$

$a_7 = a(7)^2+7b+c = 17.2 \rightsquigarrow 49a+7b+c = 17.2$

$\begin{cases} -25a-5b-c = -16 \\ 49a+7b+c = 17.2 \end{cases}$

$24a+2b = 3.2 \underset{\div 2}{\rightsquigarrow} 12a+b = 1.6$

$-2.4+b = 1.6 \to b=4$

۲ ✓

c جایگذاری $\rightsquigarrow \underbrace{25(-0.2)}_{-5} + \underbrace{5(4)}_{20} + c = 14 \rightsquigarrow c=-1 \Rightarrow a_n = -0.2n^2+4n-1$

$a_1 = -0.2+5-1 = 2.8, \quad a_{15} = \overbrace{-0.2(15)^2}^{-45} + \overbrace{4(15)}^{60} - 1 = 14 \qquad \frac{a_{15}}{a_1} = \frac{14}{2.8} = \boxed{5}$

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$a_4 : a+3d \rightsquigarrow a'+d' \overset{*}{=} -8d'$

$a_8 = a+7d \rightsquigarrow a'+7d' \overset{*}{=} -3d'$

$\rightsquigarrow \begin{cases} (a+3d = -8d')- \to -a-3d = 8d' \\ a+7d = -3d' \end{cases} \rightsquigarrow 4d = 5d'$

$*d = \frac{5}{4}d'$

$a'+9d' = 0 \rightsquigarrow *a' = -9d'$

[illegible] $a_{15} \Rightarrow \frac{\overset{-9d'}{a'}+14d'}{d} = \frac{5d'}{*\frac{5}{4}d'} = \frac{5}{\frac{5}{4}} = 4$ برابر

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$6a_2^2 = 5a_3 a + 3a_2 a$

$6a_2^2 - 3a_2 a_1 + 5a_3 a \rightsquigarrow 3a_2(\underbrace{\overbrace{2a_2}^{2(a_1+d)} - a}_{a+2d}) = \underbrace{5a_3 a}_{a(a_1+2d)a}$

$\frac{a_3}{d} = \frac{a_1+2d}{d}$ $\begin{cases} ① \ \frac{-2d+2d}{d} = \frac{d}{d} = \boxed{1} \\ ② \ \frac{\frac{3}{2}d+2d}{d} = \frac{\frac{7}{2}d}{d} = \frac{7}{2} = \boxed{3/5} \end{cases}$

$3a_2(a_1+2d) = 5a_1(a_1+2d) \rightsquigarrow 3a_2 = 5a_1 \to a_1 = \frac{3}{2}d$

$\underbrace{3(a_1+d)}_{3a_1+3d} = 5a_1 \rightsquigarrow \boxed{3d = 2a_1}$ ②

$a_1+2d = 0 \to \boxed{a_1 = -2d}$ ①

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$a_2 = a_1+d \quad a_3 = a_1+2d$

۷

حسابی $a_n: c, b, a \rightsquigarrow a = c+2d, \ b = c+d$

هندسی $b_n: \frac{c}{4}, \frac{a}{2}, b \rightsquigarrow \frac{a}{2} = \frac{c}{4}(q), \ b = \frac{c}{4}(q^2)$

$a = \frac{c}{2}q$

$b \rightsquigarrow c+d = \frac{c}{4}q^2 \rightsquigarrow d = \frac{c}{4}q^2 - c \to c(\frac{q^2}{4}-1)$

$a \rightsquigarrow c+2d = \frac{c}{2}q \rightsquigarrow 2d = \frac{c}{2}q - c \to c(\frac{q}{2}-1)$

$\frac{2d}{d} = \frac{c(\frac{q}{2}-1)}{c(\frac{q^2}{4}-1)} = \frac{(\frac{q}{2}-1)}{(\frac{q}{2}+1)(\frac{q}{2}-1)} \rightsquigarrow 2 = \frac{1}{\frac{q}{2}+1} \rightsquigarrow q+2 = 1 \rightsquigarrow q = -1$

$2q = -2$

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۸

هندسی $c, b, a \rightsquigarrow b = cq, \ a = cq^2$

$c, 2a, 3b \rightsquigarrow 2a = c+d, \ 3b = c+2d$

$3b \rightsquigarrow 3cq = c+2d \rightsquigarrow 3cq - c = 2d \rightsquigarrow c(3q-1) = 2d$

$2a \rightsquigarrow 2cq^2 = c+d \rightsquigarrow 2cq^2 - c = d \rightsquigarrow c(2q^2-1) = d$

۲ ✓

$\frac{2d}{d} = \frac{c(3q-1)}{c(2q^2-1)} \Rightarrow 2 = \frac{3q-1}{2q^2-1}$

$4q^2 - 2 = 3q - 1 \rightsquigarrow 4q^2 - 3q - 1 = 0 \rightsquigarrow q^2 - 3q - 4 = 0$; $(q-4)(q+1) = 0$ $\begin{cases} q = \frac{4}{4} = 1 \ \text{غ ق ق} \\ q = \frac{-1}{4} \end{cases}$

$\frac{a_9}{a_6} = \frac{a_1 q^8}{a_1 q^5} = q^3 = (\frac{-1}{4})^3 = \frac{-1}{64}$

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$\frac{a_4}{(a_2)^3} + \frac{a_2}{a_1^2} = 2 \rightsquigarrow \frac{a_1 q^{3}}{a_1^3 q^3} + \frac{a_1 q}{a_1^2} = 2 \rightsquigarrow \frac{q^2}{a_1^2} + \frac{q}{a_1} = 2 \rightsquigarrow \frac{q^2}{a_1^2} + \frac{q}{a_1} - 2 = 0$

$(a_2)^3 \to (a_1 q)^3$

$(\frac{q}{a_1}+2)(\frac{q}{a_1}-1) = 0$

$* \ \frac{q}{a_1} = \begin{cases} -2 \\ 1 \end{cases}$

$\frac{a_1^2}{a_2} = \frac{a_1^2}{a_1 q} = \frac{a_1}{q} \rightsquigarrow \frac{a_1}{q} = 1 \ / \ \frac{-1}{2}$

۲ ✓

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$a_3^2 = a_4 \rightsquigarrow a_3^2 = a_3 q \rightsquigarrow q = a_3$

$a_5 = 27$

$\frac{a_5}{a_3} = \frac{a_1 q^4}{a_1 q^2} = q^2 = \frac{27}{\frac{a_3}{q}} \rightsquigarrow q^3 = 27 \rightsquigarrow q = 3$

۲ ✓

$a_5 = a_1 q^4 \rightsquigarrow a_1 = \frac{a_5}{q^4} = \frac{27}{3^4} = \frac{27}{81} = \frac{1}{3}$

$\frac{1}{2} - \frac{1}{3} = \frac{1}{6}$

$\frac{3}{6} \quad \frac{2}{6}$