نام و نام خانوادگی ........خط اجری................ پاسخنامه تشریحی تکلیف شماره ......۱۷.. کلاس ..........دهم A.........

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| ۱ | $\{\underline{1}\},\{2,3,\underline{4}\},\{5,6,7,8,\underline{9}\}$<br>رقم آخر دسته نهم ← فرمول: $n^2 \Rightarrow \underline{9^2=81}$<br>فرمول رقم اول ← $(n-1)^2+1$ ← دسته دوم: $(2-1)^2+1=2$<br>دسته نهم: $(9-1)^2+1=\underline{65}$<br>واسطه حسابی: $\frac{a+b}{2} \Leftarrow \frac{65+81}{2}=73$ |
| ۲ | $\{1,2,3\},\{4,5,\dots 12\},\{13,14,\dots 39\},\{40,\dots,120\},\underbrace{\{121,\dots,363\}}_{\text{دسته ۵}}$<br>$\frac{121+363}{2}=\frac{484}{2}=242$ $\quad (363 \to 3\times121)$ |
| ۳ | $2k \rightsquigarrow n=9,6,3,0 \rightsquigarrow k=0,1,2,\dots$<br>$-2k+4 \rightsquigarrow n=1,4,7 \rightsquigarrow k=0,1,2,\dots$<br>$\left[\frac{n}{k+2}\right]+\underset{-2}{a} \rightsquigarrow n=2,5,8 \rightsquigarrow k=0,1,2,\dots$<br>$a_0=2^0=1$<br>$a_1=-2(0)+4=4$<br>$*a_2=\left[\frac{2}{0+2}\right]+a=\underset{1-2=-1}{1+a}$<br>$a_3=2^1=2$<br>$a_4=-2(1)+4=2$<br>$*a_5=\left[\frac{5}{1+2}\right]+a=1+\underset{-2}{a}=-1$<br>$a_6=2^2=4$<br>$a_7=-2(2)+4=0$<br>$*a_8=\left[\frac{8}{2+2}\right]+a \to \underset{0}{2+a}$<br>$a_9=2^3=8$<br>$S_{10}=1+4+1+a+2+2+1+a+4+0+2+a+8=25+3a=19$<br>$3a=-6 \rightsquigarrow a=-2$<br>$a_2+a_5+a_8+\dots+a_{29}=(-1)+(-1)+(0)+(0)+\dots+(0)=\boxed{-2}$ |
| ۴ | $*a=\frac{1}{70}\times -14=-0/2$<br>درجه ۲ « $a_n=an^2+bn+c$ »<br>$a_5=a(5)^2+5b+c=14 \rightsquigarrow (25a+5b+c=14)-$<br>$a_7=a(7)^2+7b+c=17/2 \rightsquigarrow 49a+7b+c=17/2$<br>$-25a-5b-c=-14$<br>$49a+7b+c=17/2$<br>$24a+2b=3/2 \underset{\div 2}{\rightsquigarrow} 12a+b=1/6$ $\quad (a=-0/2)$<br>$*\ -2/4+b=1/6 \to b=4$<br>$c \underset{\text{جانشانی}}{\rightsquigarrow} \frac{25(-0/2)}{-5}+\frac{5(4)}{20}+c=14 \rightsquigarrow c=-1 \Rightarrow a_n=-0/2n^2+4n-1$<br>$a_1=-0/2+5-1=3/8,\ a_{15}=\underbrace{-0/2(15)^2}_{-45}+\underbrace{4(15)}_{60}-1=14$ $\quad \frac{a_{15}}{a_1}=\frac{14}{2/8}=\boxed{5}$ |
| ۵ | $a_4=a+3d \rightsquigarrow a'+d' \overset{*}{=} -8d'$<br>$a_8=a+7d \rightsquigarrow a'+4d' \overset{*}{=} -3d'$<br>$\rightsquigarrow \begin{cases}(a+3d=-8d')- \to -a-3d=8d' \\ a+7d=-3d'\end{cases} \rightsquigarrow 4d=5d'$<br>$*d=\frac{5}{4}d'$<br>$a'+9d'=0 \rightsquigarrow *a'=-9d'$<br>دنباله دوم $a_{15} \Rightarrow \frac{\overset{-9d'}{a'}+14d'}{d}=\frac{5d'}{*\frac{5}{4}d'}=\frac{\frac{5}{1}}{\frac{5}{4}}=4$ برابر |

**۶**

$6a_2^2 = 5a_3a + 2a_2a$

$6a_2^2 - 2a_2a = 5a_3a \rightsquigarrow 2a_2(\underbrace{3a_2 - a}_{2a+3d}) = \underbrace{5a_3a}_{5(a_1+2d)a}$ , $3(a_1+d)-a$

$\frac{a_4}{d} = \frac{a_1+3d}{d}$ $\begin{cases} ①\ \frac{-2d+3d}{d} = \frac{d}{d} = \boxed{1} \\ ②\ \frac{\frac{3}{2}d+3d}{d} = \frac{\frac{9}{2}d}{d} = \frac{9}{2} = \boxed{4/5} \end{cases}$

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

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

$a_1+2d = 0 \to a_1 = -2d$ ①

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

**۷**

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

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

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

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

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

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

$2q = -2$

**۸**

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

$c, 2a, 3b \rightsquigarrow 2a = c+d$ و $\underbrace{3b = c+2d}$

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

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

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

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

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

**۹**

$\frac{a_6}{(a_2)^3} + \frac{a_2}{a^2} = 2 \rightsquigarrow \frac{a_1 q^{\cancel{5}2}}{a_1^{3} \cancel{q^3}} + \frac{a_1q}{a_1^2} = 2 \rightsquigarrow \frac{q^2}{a_1^2} + \frac{q}{a_1} = 2 \rightsquigarrow \frac{q^2}{a_1^2} + 1\frac{q}{a_1} - 2 = 0$

$(a_2)^3 \to (a_1q)^3$

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

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

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

**۱۰**

$a_3^2 = a_4 \rightsquigarrow a_3^2 = \cancel{a_3}q \rightsquigarrow q = a_3$

$a_5 = 27$

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

$a_5 = a_1q^4 \rightsquigarrow a_1 = \frac{a_5}{q^4} = \frac{27}{3^4} = \frac{27}{81} = \frac{1}{3}$

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

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