

گروه: دهم / شنبه

۱۷

سری: ۱۷

نام و نام خانوادگی: تانیا ترک تری

$$9^2 = 81 = \text{عدد آخر در دسته نهم}$$

اعداد اول در دهه ها
 ۱ ۲ ۵ ۱۰ ۱۷ ۲۶ ۳۷ ۵۰ ۶۵
 (۱) (۲) (۳) (۴) (۵) (۶) (۷) (۸) (۹)

$$65 = \text{عدد اول در دسته نهم}$$

$$\frac{81 + 65}{2} = 73 \leftarrow \text{وسط حسابی بین دو عدد}$$

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$$a_n = \frac{1}{r} b_n \quad \text{تقریباً اعضای دسته} \quad T_n = b_n - a_{n+1} \xrightarrow{a_n = \frac{1}{r} b_n} T_n = b_n - \frac{1}{r} b_{n+1} + 1 = \frac{r}{r} b_n + 1$$

$$a_1 = 1 \quad b_1 = 3a_1 = 3 \rightarrow \text{دسته اول تا ۳} \quad a_2 = 4 \Rightarrow b_2 = 3a_2 = 12 \rightarrow \text{دسته دوم از ۱۲ تا ۱۳}$$

$$a_3 = 13 \quad b_3 = 39 \rightarrow \text{دسته سوم از ۳۹ تا ۴۰} \quad a_4 = 40 \quad b_4 = 120 \rightarrow \text{دسته چهارم از ۱۲۰ تا ۱۲۱}$$

$$a_5 = 121 \quad b_5 = 363 \rightarrow \text{دسته پنجم از ۳۶۳ تا ۳۶۴} \quad \text{میانگین} = \frac{a_5 + b_5}{2} = \frac{121 + 363}{2} = 242$$

$$S_{40} = \frac{1}{r} (a_1 + a_{40}) = 19 \Rightarrow S_{10} \Rightarrow 18 + 3a_{10} = 19 \Rightarrow a_{10} = \frac{1}{3}$$

$$a_n = \begin{cases} r^k; & n = 3k \\ -2k + 4; & n = 3k + 1 \\ \left\lfloor \frac{n}{k+2} \right\rfloor + a; & n = 3k + 2 \end{cases}$$

$$a_1 + a_2 + \dots + a_{24} = \frac{1}{3} + \frac{1}{3} + \frac{1}{3} + \frac{1}{3} + \frac{1}{3} + \frac{1}{3} + \frac{1}{3} + \frac{1}{3} + \frac{1}{3} + \frac{1}{3} = \frac{24}{3}$$

$$a_n = an^r + bn + c$$

$$a = -\frac{a_5}{V_0} = -\frac{14}{V_0} = -0.12$$

$$\frac{a_{15}}{a_1} = \frac{14}{18} = \frac{7}{9}$$

$$a_5 = 14$$

$$a_V = 14/r$$

$$\begin{aligned} n=5 &\rightarrow -0.12(25) + 5b + c = 14 \Rightarrow 5b + c = 19 \\ n=V &\rightarrow -0.12(49) + Vb + c = 14/r \Rightarrow Vb + c = 24 \end{aligned} \Rightarrow$$

$$5b + c = 19 \xrightarrow{b=4} c = -1$$

$$a_n = -0.12n^2 + 4n - 1$$

$$a_1 = -0.12(1) + 4(1) - 1 = -0.12 + 4 - 1 = 2.88$$

$$a_5 = -0.12(25) + 4(5) - 1 = -3 + 20 - 1 = 14$$

$$\begin{aligned} a_r = L_r &\Rightarrow a_1 + rd = L_1 + r \Rightarrow a_1 + rd = (-9r) + r \Rightarrow a_1 + rd = -8r \\ a_1 &= L_1 \Rightarrow a_1 + vd = L_1 + 4r \Rightarrow a_1 + vd = (-9r) + 4r \Rightarrow a_1 + vd = -5r \\ \Rightarrow rd &= -8r \Rightarrow d = -8 \\ L_1 + 4r &= 0 \Rightarrow L_1 = -4r \end{aligned}$$

$$L_{15} = (-4r) + 14r = 10r$$

$$\frac{L_{15}}{d} = \frac{10r}{-8} \xrightarrow{r \neq 0} \frac{L_{15}}{d} = -\frac{5}{4}$$

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$$\left. \begin{aligned} a_r &= a + d \\ a_r &= a + rd \end{aligned} \right\} \Rightarrow 4(a+d)^r = 5(a+rd)a + 3(a+d)a \Rightarrow$$

$$\frac{a_f}{d} = 1/5 \quad \underline{1}$$

$$\frac{a_f}{d} = 1 \quad \checkmark$$

$$4(a^r + rad + d^r) = (5a^r + 10ad) + (3a^r + 3ad) \Rightarrow 4a^r + 1rad + 4d^r = 10a^r + 13ad$$

$$\Rightarrow 4a^r + ad - 4d^r = 0 \quad r\left(\frac{a}{d}\right)^r + \left(\frac{a}{d}\right) - 4 = 0 \rightarrow rx^r + x - 4 = 0 \Rightarrow \begin{cases} x = \frac{r}{r} \\ x = -r \end{cases}$$

$$\frac{a_f}{d} = \frac{a+rd}{d} = \frac{a}{d} + r = x + r \quad \textcircled{1} x = \frac{r}{r} \Rightarrow \frac{a_f}{d} = \frac{r}{r} + r = 1/5 \quad \textcircled{2} x = -r \Rightarrow \frac{a_f}{d} = -r + r = 1$$

$$b = a + d \quad G_1 = \frac{b}{a} \quad G_r = \frac{a}{r} \quad G_r = \frac{c}{r} \quad (G_r)^r = G_1 \times G_r \Rightarrow \left(\frac{a}{r}\right)^r = \left(\frac{b}{a}\right)\left(\frac{c}{r}\right) \Rightarrow \frac{a^r}{r^r} = \frac{bc}{ra} \Rightarrow$$

$$c = b + d = (a + d) + d = a + 2d$$

$$q = \frac{a}{\frac{b}{a}} = \frac{a^2}{b} \Rightarrow \boxed{q = -a} \quad \frac{a^r}{r^r} = \frac{a}{r} \times a \quad a^r = \frac{bc}{a}$$

$$q = -1 \quad r_q = -r \quad \boxed{a^r = bc}$$

$$\left. \begin{aligned} rb &= a + c \\ a^r &= bc \end{aligned} \right\} \xrightarrow{c = rb - a} a^r = b(rb - a) \Rightarrow a^r = rb^r - ab \Rightarrow r\left(\frac{b}{a}\right)^r - \left(\frac{b}{a}\right) - 1 = 0 \quad \frac{b}{a} = x$$

$$ry^r - y - 1 = 0 \Rightarrow \begin{cases} y = 1 \Rightarrow \frac{b}{a} = 1 \Rightarrow b = a \quad \times \\ y = -\frac{1}{r} \Rightarrow \frac{b}{a} = -\frac{1}{r} \Rightarrow b = -\frac{1}{r}a \quad \checkmark \end{cases}$$

$$r\left(-\frac{1}{r}a\right) = a + c \Rightarrow c = -ra \quad \begin{cases} a \\ -\frac{1}{r}a \\ -ra \end{cases}$$

$$d = b - a = -\frac{r}{r}a$$

$$\left. \begin{aligned} b &= ar \\ c &= ar^r \end{aligned} \right\} \xrightarrow{\text{حسابی}} rB_r = B_1 + B_r \rightarrow r(2a) = 3d + c \quad c = ar^r = 4a$$

$$\left. \begin{aligned} B_1 &= 3d \\ B_r &= 2a \\ B_r &= c \end{aligned} \right\} \xrightarrow{\text{حسابی}} \begin{aligned} B_1 &= 3d = 0 \\ B_r &= 2a \\ B_r &= c = 4a \end{aligned}$$

$$4a = 3d + c \Rightarrow 4a = 3d + 4a \Rightarrow d = 0$$

$$\text{قدر مشترک} = B_r - B_1 = 2a \quad 2a(n-1) \quad \frac{B_4}{B_2} = \frac{16a}{4a} = \frac{4}{1}$$

$$B_4 = 2a(4-1) = 6a \quad B_2 = 2a(2-1) = 2a$$

$$\frac{a^r}{(ar)^r} + \frac{a^r}{a^r} = r \Rightarrow \frac{a^r}{a^r} + \frac{a^r}{a^r} = r \rightarrow a \neq 0$$

$$\frac{ar}{(ar)^r} + \frac{ar}{a^r}$$

$$\frac{a^r}{G_r} = \frac{a^r}{ar} = \frac{a}{r}$$

$$\left\{ \frac{a}{r} \in \mathbb{R} - \{0\} \right\}$$

به تفاوت زیورند و توان

دقت کن!

$$G_r = \sqrt{G_f} \quad G_\omega = rv \quad ar^r = \sqrt{ar^r}$$

$$G_r = ar^r \quad G_f = ar^r \quad G_\omega = ar^r = rv$$

$$(ar^r)^r = ar^r \Rightarrow ar^r = ar^r$$

$$\frac{ar^r}{ar^r} = \frac{ar^r}{ar^r} \Rightarrow ar = 1 \quad \left. \begin{aligned} ar^r &= rv \end{aligned} \right\} \Rightarrow r^r = rv \Rightarrow r = \frac{1}{r}$$

$$\text{اختلاف} = \frac{1}{r} - a \Rightarrow \frac{1}{r} - \frac{1}{r} = \frac{1}{r} \quad \textcircled{2}$$

$a_0, a_3, a_4, a_9 \rightarrow$ ضابطی اول (2^k)

$a_1, a_2, a_7 \rightarrow$ ضابطی دوم $(-2k+2)$

$a_2, a_5, a_8 \rightarrow$ ضابطی سوم $\left[\frac{n}{k+2}\right] + a$

$a_2 = \left[\frac{2}{2}\right] + a$ $a_2 = a + 1$
$a_5 = \left[\frac{5}{2}\right] + a$ $a_5 = a + 1$
$a_8 = \left[\frac{8}{2}\right] + a$ $a_8 = a + 2$

$a_0 = 2^0$ $a_0 = 1$	$a_3 = 2^1$ $a_3 = 2$	$a_4 = 2^2$ $a_4 = 4$	$a_9 = 2^3$ $a_9 = 8$
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$a_1 = -2(0) + 2$ $a_1 = 2$	$a_2 = -2(1) + 2$ $a_2 = 0$	$a_7 = -2(2) + 2$ $a_7 = -2$
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$$S_{10} = 1 + 2 + a_2 + 2 + 2 + a_5 + 4 + 0 + a_8 + 8 = 19$$

$$a_2 + a_5 + a_8 = -2 \rightarrow 3a + 4 = -2 \rightarrow \boxed{a = -2}$$

مجموع مثبتات $a_2 + a_5 + \dots$ از ضابطی سوم بدست می آید

$$a_n = \left[\frac{2k+2}{k+2}\right] + (-2)$$

$$a_n = \left[\frac{2k+2 + k-2}{k+2}\right] - 2 = \left[2 + \frac{k-2}{k+2}\right] - 2 = \boxed{\left[\frac{k+2}{k-2}\right]}$$

عبارت $\left[\frac{k+2}{k-2}\right]$ به ازای $k=0$ و $k=1$ برابر ۱- است دنباله ازای k صحیح برابر

$$S = a_2 + a_5 + a_8 + \dots + a_{24}$$

۰ است پس داریم:

$$S = (-1) + (-1) + 0 + \dots + 0 = \boxed{-2}$$

$$\frac{aq^a}{(aq)^r} = \frac{a \times q^a}{a^r \times q^r} = \frac{q^r}{a^r}$$

$$\frac{ar}{a^r} = \frac{aq}{a^r} = \frac{q}{a}$$

$$\left(\frac{q}{a} + 2\right) \left(\frac{q}{a} - 1\right) = 0 \rightarrow \frac{q}{a} = 1 \rightarrow \frac{a}{q} = 1 \checkmark$$

$$\rightarrow \frac{q}{a} = -2 \rightarrow \frac{a}{q} = -\frac{1}{2} \checkmark$$

$$\frac{aq^a}{(aq)^r} = \frac{a \times q^a}{a^r \times q^r} = \frac{q^r}{a^r} \quad \left. \begin{array}{l} \\ \\ \end{array} \right\} \rightarrow \left(\frac{q}{a}\right)^r + \frac{q}{a} - r = 0$$

$$\frac{ar}{a^r} = \frac{aq}{a^r} = \frac{q}{a}$$

$$\left(\frac{q}{a} + r\right) \left(\frac{q}{a} - 1\right) = 0 \quad \rightarrow \frac{q}{a} = 1 \rightarrow \frac{a}{q} = 1 \quad \checkmark$$

$$\rightarrow \frac{q}{a} = -r \rightarrow \frac{a}{q} = -\frac{1}{r} \quad \checkmark$$