

نام و نام خانوادگی: پاسخنامه تشریحی تکلیف شماره ۱۷ کلاس ۱۷

باقی‌مانده به عدد ارسال ما عدد فرجه درسته برابر n^2 و عدد اول آن $(n-1)^2 + 1$ است :

دسته $\rightarrow$ $\begin{cases} 9^2 = 81 \\ 1^2 + 1 = 2 \end{cases}$ $\rightarrow$ $\frac{81+2}{2} = \frac{83}{2}$

دسته $\rightarrow$ $\{1, 2, 3\}$ دسته دوم $\rightarrow$ $\{4, \dots, 12\}$ دسته $\rightarrow$ $\{13, \dots, 21\}$ دسته چهارم $\rightarrow$ $\{22, \dots, 30\}$

میانگین عدد اول و آخر برابر $\Rightarrow$ چون اعداد یکنواختی درونی دنباله حسابی هستند $\rightarrow$ میانگین اول اعضاست . (در واقع جمله وسطی)

$\rightarrow \frac{1+30}{2} = \frac{31}{2}$

$a_0 + a_1 + a_2 + a_3 + a_4 + a_5 + a_6 + a_7 + a_8 + a_9 = 2^0 + 2^1 + 2^2 + \dots + 2^9 = 1 + 2 + 4 + 8 + 16 + 32 + 64 + 128 + 256 + 512 = 1023$

$a_0, a_1, a_2, \dots \rightarrow n = 3k+2$ $\rightarrow$ $\left[\frac{2}{3}\right] - 2 + \left[\frac{5}{3}\right] - 2 + \left[\frac{8}{3}\right] - 2 + \left[\frac{11}{3}\right] - 2 + \left[\frac{14}{3}\right] - 2 + \left[\frac{17}{3}\right] - 2 + \left[\frac{20}{3}\right] - 2 = -2$

$a_0 = 14 \rightarrow$ $a_n = an^2 + bn + c$ $\rightarrow a = \frac{1}{6}(-14) = -\frac{7}{3}$

$\Rightarrow \begin{cases} a_0 = -\frac{7}{3}(0^2) + 0b + c = 14 \rightarrow c = 14 \\ a_1 = -\frac{7}{3}(1^2) + b + c = 17 \rightarrow b = 1 \rightarrow c = -1 \end{cases}$ $\Rightarrow a_n = -\frac{7}{3}n^2 + n - 1$

فرمول عمومی: $t_n = an + b \rightarrow t_m - t_n = (m-n)a \rightarrow t_5 - t_1 = 4a$

$t_1 = f_1 + (n-1)d \rightarrow t_1 - f_1 = 0$ $\rightarrow t_1 = f_1$ $\rightarrow t_5 - t_1 = 4d \Rightarrow 5a = 4d$ $\rightarrow \frac{t_5}{d} = \frac{5a+b}{d} = \frac{5(4d)+(-1d)}{d} = 19$

$$a_r = a_1 \text{ (مساوی)} \rightarrow q_{a_1}^r = a(n+d)(a_1-d) + q_{a_1}(n-d) = a_1^r - ad^r + q_{a_1}^r - q_{a_1}nd$$

$$a_r = a_1 + d$$

$$a_1 = a_1 - d$$

$$\Rightarrow \underbrace{a_1^r}_{a} - \underbrace{r d^r}_{b} - \underbrace{q_{a_1}nd}_{c} \xrightarrow{\text{! لذا}} \Delta = b^r - 4ac = 4d^r + 4d^r = 8d^r$$

$$\rightarrow a_1 = \frac{-b \pm \sqrt{\Delta}}{2a} = \frac{rd \pm \sqrt{8d^r}}{2}$$

$$\rightarrow a_r = a_1 + rd \rightarrow \begin{cases} 1, rd + rd = 4, rd = a_r \\ -rd + rd = d = a_r \end{cases}$$

$$\rightarrow \frac{a_r}{d} \rightarrow \begin{cases} \frac{4, rd}{d} = 4, r \\ \frac{d}{d} = 1 \end{cases}$$

$$\rightarrow \begin{cases} a = rd = a_r \\ a_1 = -d = a_r \end{cases} \Rightarrow a = a_r - d \rightarrow \begin{cases} a = 1, rd \\ a = -rd \end{cases}$$

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$$a, b, c \xrightarrow{\text{مساوی}} b = \frac{a+c}{2} \Rightarrow \frac{c}{a} = q = \frac{c}{\frac{a+c}{2}} = \frac{2c}{a+c} = \frac{a}{a+c} \xrightarrow{\text{لضرب}} c^r + ac = 2a^r$$

$$\rightarrow c^r + ac - 2a^r = 0$$

$$q_a^r = \Delta = b^r - 4ac = a^r + 1a^r$$

$$\rightarrow C = \frac{-b \pm \sqrt{\Delta}}{2a} = \frac{-a \pm \sqrt{9a^r}}{2} \rightarrow \begin{cases} c = -2a \\ c = a \rightarrow \text{مغشوق} \end{cases}$$

$$q = \frac{c}{a} = \frac{-2a}{a} = -2 \xrightarrow{\text{مقابلانہ}} 2 \times (-1) = -2$$

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$$b^r = ac \quad 3b+c=fa \Rightarrow b = \frac{fa-c}{3} \xrightarrow{\text{مساوی}} b^r = \frac{14a^r+c^r-11ac}{9} \Rightarrow \frac{14a^r+c^r-11ac}{9} = ac$$

$$\rightarrow 14a^r+c^r-11ac=9ac \rightarrow 14a^r+c^r-20ac=0 \rightarrow \Delta = b^r - 4ac = 219c^r - 4(14)(c^r) = 225c^r$$

$$\rightarrow a = \frac{-b \pm \sqrt{\Delta}}{2a} = \frac{-11c \pm 15c}{22} = \frac{4c}{22} = \frac{2c}{11} \rightarrow \frac{c}{a} = q = \frac{11}{2} \rightarrow q = \frac{11}{2} \rightarrow \frac{a_1}{a_4} = q^3 = \left(\frac{11}{2}\right)^3 = \frac{1331}{8}$$

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$$\frac{a_q}{(a_r)^r} + \frac{a_r}{a_1^r} \Rightarrow \frac{a_q^r}{a_r^r q^r} = \frac{q^r}{a_r^r}, \quad \frac{a_q}{a_r^r} \rightarrow \frac{q^r + a_q}{a_r^r} = 2 \rightarrow \frac{q^r + a_q - 2a_r^r}{a_r^r} = 0 \rightarrow a = \frac{-q + \sqrt{9q^r}}{-2} = \frac{-q}{2}$$

$$\frac{a_r}{a_q} = \frac{a}{q} \rightarrow \begin{cases} a = \frac{-q}{2} \rightarrow \frac{-q}{2} = \frac{a^r}{q^r} = \frac{-1}{2} = \frac{a^r}{a_r^r} \\ a = q \rightarrow \frac{a^r}{a_q^r} = \frac{q^r}{q^r} = 1 = \frac{a^r}{a_r^r} \end{cases}$$

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$$a_0 = \sqrt{v} \rightarrow a_r = \frac{\sqrt{v}}{q^r}, \quad a_r = \sqrt{a_r} \rightarrow \frac{\sqrt{v}}{q^r} = \sqrt{\frac{\sqrt{v}}{q}} = \frac{\sqrt[4]{v}}{\sqrt{q}} \xrightarrow{\text{مساوی}} \frac{\sqrt[4]{v}}{q^r} = \frac{\sqrt[4]{v}}{q} \rightarrow \sqrt[4]{v} q = q^r$$

$$\rightarrow a_0 = a_1, q^r = \sqrt{v} \rightarrow \frac{\sqrt{v}}{q^r} = a_1 \rightarrow \frac{\sqrt{v}}{11} = a_1 = \frac{1}{3} \rightarrow \frac{1}{3} - \frac{1}{11} = \frac{8}{33} = \frac{1}{q}$$

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