

نام و نام خانوادگی علی حسینی پاسخنامه تشریحی تکلیف شماره ۱۷ کلاس پسر ۱۹, ۱۵

$$\{1\}, \{2, 3, 4\}, \{5, 6, 7, 8, 9\}, \dots, \{95, \dots, 11\} \Rightarrow \frac{11+95}{2} = \frac{144}{2} = 72 \checkmark$$

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$$t_1 = \{1, 2, 3\} \quad t_2 = \{4, 5, 6, 7, 8, 9, 10, 11, 12\} \quad t_3 = \{13, 14, \dots, 39\} \quad t_4 = \{40, 41, \dots, 116, 117\}$$

$$t_5 = \{118, 119, \dots, 393\}$$

$$\frac{393+118}{2} = 242 \checkmark$$

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جواب صفحه آخر ...

$$n=1 \xrightarrow{r(k+1)=k=0} a_1 = -2(0) + 4 = 4 \quad n=2 \xrightarrow{r(k+1)=k=1} a_2 = \left[\frac{2}{1+2}\right] + a = 1 + a \quad n=3 \xrightarrow{r(k+1)=k=2} a_3 = 2^1 = 2 \checkmark$$

$$n=4 \xrightarrow{r(k+1)=k=3} a_4 = -2(1) + 4 = 2 \quad n=5 \xrightarrow{r(k+1)=k=4} a_5 = \left[\frac{0}{1+2}\right] + a = [1, 5] + a = 1 + a \quad n=6 \xrightarrow{r(k+1)=k=5} a_6 = 2^2 = 4 \quad n=7 \xrightarrow{r(k+1)=k=6} a_7 = -2(2) + 4 = 0 \quad n=8 \xrightarrow{r(k+1)=k=7} a_8 = \left[\frac{1}{2+2}\right] + a = 2 + a$$

$$n=9 \xrightarrow{r(k+1)=k=8} a_9 = 2^3 = 8 \quad n=10 \xrightarrow{r(k+1)=k=9} a_{10} = -2(3) + 4 = -2$$

اختیار ۹ و ۱۰ نیست

$$4 + (1+a) + 2 + 2 + (1+a) + 4 + 0 + (2+a) + 1 + -2 = 19 \Rightarrow 22 + 3a = 19 \Rightarrow 3a = -3 \Rightarrow a = -1$$

$$a_1 + a_2 + \dots + a_{10} \quad a = -1 \Rightarrow a_n = \left[\frac{r(k+1)}{k+2}\right] - 1$$

$n=2 \rightarrow k=0$
 $n=5 \rightarrow k=1$
 $n=6 \rightarrow k=2$
 $n=7 \rightarrow k=3$
 $n=8 \rightarrow k=4$
 $n=9 \rightarrow k=5$
 $n=10 \rightarrow k=6$

(۱, ۲, ۵)

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$$a = \frac{1}{v_0} \times (-t_0) = \frac{1}{v_0} \times (-14) = -0,2 \quad n=2: \quad t_2 = -0,2(2)^2 + \Delta b + c = 14$$

$$-0,2(2^2) + \Delta b + c = 14 \Rightarrow \Delta b + c = 19$$

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$$t_v = -0,2(v)^2 + vb + c = 14,2$$

$$-0,2(1) + vb + c = 14,2 \Rightarrow vb + c = 14,4 \quad (vb + c) - (\Delta b + c) = 14,4 - 19 \Rightarrow vb = -4,6 \Rightarrow b = -4,6$$

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$$2(4) + c = 17 \Rightarrow 8 + c = 17 \Rightarrow c = 9 \Rightarrow t_n = -0,2n^2 + 4n - 1$$

$$n=1 \rightarrow t_1 = -0,2(1)^2 + 4(1) - 1 = -0,2 + 4 - 1 = 2,8$$

$$\frac{t_{10}}{t_1} = \frac{14}{2,8} = 5 \checkmark$$

$$n=10 \rightarrow t_{10} = -0,2(10)^2 + 4(10) - 1 \rightarrow t_{10} = -20 + 40 - 1 = 19$$

$$a_n = A_n + B \quad a_{10} = 0 \Rightarrow 10A + B = 0 \Rightarrow B = -10A \Rightarrow a_n = A(n-10)$$

$$x + 3d = a_4 = A(4-10) = -6A \quad x + 7d = a_8 = A(8-10) = -2A$$

$$(x + 7d) - (x + 3d) = -2A - (-6A) \quad 4d = 4A \Rightarrow A = d$$

$$a_{10} = A(10-10) = 0 \rightarrow a_{10} = 0 \Rightarrow \frac{a_{10}}{d} = \frac{0}{d} = 0 \checkmark$$

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$a_r = a + d, a_r = a + rd \quad \begin{aligned} & \frac{1}{2}(a+d)^2 = \frac{1}{2}a(a+rd) + \frac{1}{2}a(a+d) \\ & \frac{1}{2}(a^2 + 2ad + d^2) = \frac{1}{2}a^2 + \frac{1}{2}ad + \frac{1}{2}a^2 + \frac{1}{2}ad \\ & \frac{1}{2}a^2 + \frac{1}{2}ad + \frac{1}{2}d^2 = \frac{1}{2}a^2 + \frac{1}{2}ad \end{aligned}$ $\rightarrow \frac{1}{2}a^2 + ad - \frac{1}{2}d^2 = 0 \xrightarrow{\frac{d \neq 0}{\frac{a}{d} = x}} \frac{1}{2}x^2 + x - \frac{1}{2} = 0 \Rightarrow x = \begin{cases} 1, 0 \\ -2 \end{cases} \rightarrow \frac{a_r}{d} = \frac{a+rd}{d} = \frac{a}{d} + r = \begin{cases} 1, 0+2=2 \\ -2, -2=1 \end{cases} \checkmark$	(2) 6
$rb = a + c \Rightarrow c = rb - a, \left(\frac{a}{r}\right)^2 = b \times \frac{c}{r} \Rightarrow \frac{a^2}{r} = \frac{bc}{r} \Rightarrow a^2 = bc$ $a^2 = b(rb - a) \quad a^2 = rb^2 - ab \Rightarrow a^2 + ab - rb^2 = 0 \rightarrow x^2 + x - r = 0 \Rightarrow (x+r)(x-1) = 0$ $\rightarrow x = 1 \rightarrow a = b \quad \text{غير قابل قبول (متساوية)} \quad x = -r \rightarrow a = -rb$ $q = \frac{a_r}{a_1} = \frac{\frac{a}{r}}{b} = \frac{a}{rb} \rightarrow q = \frac{-rb}{rb} = -1$ $r q = r \times (-1) = -r \quad \checkmark$	(2) 7
$a, b = aq, c = aq^2 \quad \begin{aligned} & r \times (ra) = c + rb \\ & \frac{1}{2}ra = c + rb \end{aligned} \rightarrow \frac{1}{2}ra = (aq^2) + r(aq)$ $\xrightarrow{a \neq 0} \frac{1}{2}r = q^2 + rq \rightarrow q^2 + rq - \frac{1}{2} = 0 \rightarrow (q+\frac{1}{2})(q-1) = 0 \Rightarrow q = \begin{cases} -\frac{1}{2} \\ 1 \end{cases} \quad \text{غير قابل قبول (متساوية)}$ $q^{(1-\frac{1}{2})} = q^{\frac{1}{2}} = (-\frac{1}{2})^{\frac{1}{2}} = -\frac{1}{2} \quad \checkmark$	(2) 8
$a_1 = a, a_r = aq, a_s = aq^2 \quad \frac{a_s}{(a_r)^2} = \frac{aq^2}{a^2q^2} = \frac{q^2}{a^2} = \left(\frac{q}{a}\right)^2 \quad \frac{a_r}{(a_1)^2} = \frac{aq}{a^2} = \frac{q}{a}$ $\Rightarrow \left(\frac{q}{a}\right)^2 + \left(\frac{q}{a}\right) = r \rightarrow \left(\frac{q}{a}\right)^2 + \left(\frac{q}{a}\right) - r = 0 \rightarrow \left(\frac{q}{a} + r\right)\left(\frac{q}{a} - 1\right) = 0 \Rightarrow \frac{q}{a} = \begin{cases} -r \\ +1 \end{cases}$ $\frac{a_r}{a_1} = \frac{a}{q} = \frac{1}{\frac{q}{a}} = \begin{cases} -\frac{1}{r} \\ 1 \end{cases} \quad \checkmark$	(2) 9
$\nexists a_r = \sqrt{a_r} \rightarrow a_r = x, a_r = xq \quad x = \sqrt{xq} \Rightarrow x^2 = xq \Rightarrow x = q \quad (x \neq 0 \text{ وجوب})$ $a_r = q \rightarrow a_1 q^r = \sqrt{a_1 q^r} \Rightarrow (q_1 q^r)^2 = a_1 q^r \Rightarrow a_1^2 q^{2r} = a_1 q^r \rightarrow a_1 q = 1 \Rightarrow a_1 = \frac{1}{q}$ $\nexists a_0 = rv \rightarrow a_0 = a_r \times q^r \xrightarrow{a_r = q} a_0 = q \times q^r = q^{r+1} \quad q^r = rv \Rightarrow q = r$ $a_1(r) = 1 \Rightarrow a_1 = \frac{1}{r} \quad \checkmark \Rightarrow \frac{1}{r} = \frac{1}{r} - \frac{1}{r} = \frac{r-r}{r} = \frac{1}{r} \quad \checkmark$	(2) 10

$$S_{10} = 1 + 4 + (1+a) + 2 + (1+a) + 4 + 0 + (2+a) + 8 = 19 \rightarrow a = -2$$

جمع جملات خواسته شده از ضابطه سوم به دست میاد :

$$a_n = \left[\frac{n}{K+2} \right] - 2 \xrightarrow{n=3K+2} \left[\frac{3K+2}{K+2} \right] - 2 = \left[2 + \frac{K-2}{K+2} \right] - 2 = \left[\frac{K-2}{K+2} \right]$$

این عبارت به ازای $K=0$ برابر ۱- و به ازای بقیه اعداد صحیح پس جواب خواسته شده ۲-.