

۱ ۲ ۳ ۴ ۵

$$\{1\} \quad \{2, 3, 4\} \quad \{5, 6, 7, 8, 9\} \quad \{10, \dots, 19\} \quad \{20, \dots, 11\}$$

$$\rightarrow \frac{25+11}{2} = 18 \checkmark$$

$$a_n = \frac{1}{3} b_n \rightarrow b_n = 3a_n \quad a_{n+1} = b_n + 1 = 3a_n + 1$$

$$b_1 = 3, a_1 = 1 \quad \text{دسته ۱}$$

$$b_2 = 12, a_2 = 3+1=4 \quad \text{دسته ۲}$$

$$b_3 = 49, a_3 = 12+1=13 \quad \text{دسته ۳}$$

$$b_4 = 120, a_4 = 49+1=50 \quad \text{دسته ۴}$$

$$b_5 = 343, a_5 = 120+1=121 \quad \text{دسته ۵}$$

$$\frac{a_5 + b_5}{2} = \frac{121 + 343}{2} = \frac{464}{2} = 232 \checkmark$$

$$a_{2k} = 2^k, a_{2k+1} = -2^k + 4, a_{2k+2} = \left[\frac{n}{k+2} \right] + a$$

جواب صفی آخر...

$$a_2 = 14, a_5 = 17, r = \frac{14}{2}$$

$$\rightarrow \frac{1}{v} \times (-a_2) = \frac{1}{v} \times (-14) = -\frac{1}{2}$$

$$a_n = An^2 + Bn + C \quad A = -\frac{1}{2}$$

$$a_2 = -\frac{1}{2}(2^2) + B(2) + C = 14 \rightarrow -2 + 2B + C = 14$$

$$a_5 = -\frac{1}{2}(5^2) + B(5) + C = \frac{17}{2} \rightarrow -\frac{25}{2} + 5B + C = \frac{17}{2}$$

$$\rightarrow 2B = 27 - 19 = 8 \quad \Delta(4) + C = 19 \quad C = 1$$

$$a_n = -\frac{1}{2}n^2 + 4n - 1$$

$$a_1 = \frac{14}{2} \quad a_{12} = 14$$

$$\frac{a_{12}}{a_1} = \frac{14}{\frac{14}{2}} = \frac{14 \times 2}{14} = 2 \checkmark$$

$$\text{حاصل} \rightarrow a_n = a_1 + (n-1)d$$

$$\text{خطی} \rightarrow b_n = An + B$$

$$a_2 = b_2, a_1 = b_1, b_1 = 0$$

$$a_2 = a_1 + rd = b_2 = 2A + B$$

$$b_1 = 1 \cdot A + B = 0 \rightarrow B = -1 \cdot A$$

$$a_1 + rd = 2A - 1 \cdot A = -1A$$

$$a_1 = b_1 \rightarrow a_1 + rd = 1A - 1 \cdot A = -1A$$

$$a_1 + 3 \times \frac{\Delta A}{r} = -1A \rightarrow a_1 = -1A - \frac{15A}{r} = -\frac{16A}{r}$$

$$b_{12} = 12A + B = 12A - 1 \cdot A = 11A$$

$$\frac{b_{12}}{d} = \frac{\Delta A}{\frac{\Delta A}{r}} = \frac{\Delta A \times r}{\Delta A} = r \checkmark$$

$$f(ar)^r = 2ar \times a + rar \times a \xrightarrow{ar=a+d} f(a^r + rad + rd^r) = 1a^r + rad$$

$$\rightarrow -ra^r - ad + rd^r = 0 \rightarrow rd^r = ra^r + ad \rightarrow \Delta = rd^r$$

$$\frac{-b \pm \sqrt{d^r rad^r}}{1r} = \frac{-b \pm \sqrt{rd^r}}{1r} = \frac{-d \pm rd}{r} = \begin{cases} \frac{rd}{r} \rightarrow \frac{rd + rd}{d} = \frac{2d}{d} = 2 \checkmark \\ -rd \rightarrow \frac{-rd + rd}{d} = \frac{0}{d} = 0 \checkmark \end{cases}$$

$$a + c = rb \quad \frac{1}{r}bc = \frac{1}{r}a^r \rightarrow a^r = (a+d)(a+rd) = a^r + rad + rd^r = 0 \rightarrow rad + rd^r = 0 \rightarrow$$

$$\rightarrow d = -\frac{r}{r}a \rightarrow r = \frac{\frac{a}{r}}{b} = \frac{a}{r(a+b)} = \frac{a}{r(-\frac{1}{r}a)} = -1 \rightarrow r \times -1 = -r \checkmark$$

$$\text{جواب} \rightarrow a, b, c \rightarrow b = ar$$

$$\text{جواب} \rightarrow c, ra, rb \rightarrow ra - c = rb - ra \rightarrow ra = ar^r + r(ar) \xrightarrow{(a \neq 0)} (r+1)(r-1) = 0 \begin{cases} r=1 \text{ or } \\ r=-1 \end{cases}$$

$$a_n = ar^{n-1} \quad \frac{a_4}{a_1} = \frac{ar^4}{ar^1} = r^3 = (-1)^3 = -1 \checkmark$$

$$\frac{a_4}{(ar)^r} + \frac{a_r}{(a)^r} = r \rightarrow \frac{ar^4}{ar^r} + \frac{ar}{a^r} = r \rightarrow \frac{r^r}{a^r} + \frac{r}{a} = r \rightarrow r^r + ar = ra^r$$

$$\rightarrow r^r + ar - ra^r = 0 \rightarrow (r+ra)(r-1) = 0 \begin{cases} r = -ra \\ r = 1 \end{cases} \rightarrow \frac{a^r}{a^r} = \frac{a^r}{ar} = \frac{a}{r} \rightarrow \frac{1}{r} \checkmark$$

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

$$a_r = \sqrt{a_r} \rightarrow (ar^r = \sqrt{ar^r}) \xrightarrow{r=1} a^r \times r^r = ar^r \rightarrow ar^r = r^r$$

$$\rightarrow a_2 = 2V \rightarrow ar^2 = 2V, r^2 = 2V \rightarrow r = \sqrt{2V}$$

$$ar^2 = 2V \rightarrow a \times 11 = 2V \rightarrow a = \frac{2V}{11} \checkmark$$

$$\rightarrow \frac{1}{r} - \frac{1}{r} = \frac{1}{r} \checkmark$$

ضابطه اول $\rightarrow a_0, a_3, a_4, a_9$

۳

ضابطه دوم $\rightarrow a_1, a_4, a_7$

ضابطه سوم $\rightarrow a_2, a_5, a_8$

$$S_{11} = 1 + 4 + (1+a) + 2 + (1+a) + 4 + 0 + (2+a) + 8 = 19 \rightarrow a = -2$$

جمع عملیات خواسته شده از ضابطه سوم بدست میاد :

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

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