

17

$$\{1\}, \{2, 3, 4\}, \{5, 6, 7, 8, 9\}, \{10, 11, 12, 13, 14, 15, 16\}$$

سوال اول

(2)

$$1, 3, 5, 7, \dots$$

$$4^2 = 16 \rightarrow \text{آخرین جمله سطر}$$

$$2n-1 \rightarrow 17 \text{ جمله سطر}$$

$$16 - (17) \Rightarrow 48 \rightarrow \text{اولین جمله سطر}$$

$$\text{مجموعه عددها} = \frac{98 + 16}{2} = \frac{114}{2} = 57 \checkmark$$

میانگین = میانگین

سوال دوم (2)

$$\{1, 2, 3\}, \{4, 5, \dots, 12\}, \{13, 14, \dots, 34\}, \{40, 41, \dots, 120\}, \{121, 122, \dots, 343\}$$

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

جمله اول این دنباله a_1 و جمله آخرش a_n است

$$a_1 + a_2 + a_3 + a_4 + a_5 + a_6 + a_7 + a_8 + a_9 = 14$$

$$a_1 = 4 \checkmark$$

$$a_1 + a_2 + \dots + a_n = 14$$

$$a_2 = \frac{2}{3} + a \checkmark$$

(125)

$$a_1 + a_2 + a_3 = \frac{14}{3} \Rightarrow 1 + 3a + 2 = \frac{14}{3} \Rightarrow 3a = -\frac{11}{3} \Rightarrow a = -\frac{11}{9}$$

$$a_2 + a_5 + a_8 + a_{11} + a_{14} + a_{17} + a_{20} + a_{23} + a_{26} + a_{29} + a_{32} + a_{35} + a_{38} + a_{41} + a_{44} + a_{47} + a_{50} + a_{53} + a_{56} + a_{59} + a_{62} + a_{65} + a_{68} + a_{71} + a_{74} + a_{77} + a_{80} + a_{83} + a_{86} + a_{89} + a_{92} + a_{95} + a_{98} + a_{101} + a_{104} + a_{107} + a_{110} + a_{113} + a_{116} + a_{119} = 14$$

$$10 + \frac{8}{3} + \frac{16}{3} + \frac{22}{3} + \frac{28}{3} + \frac{34}{3} + \frac{40}{3} + \frac{46}{3} + \frac{52}{3} + \frac{58}{3} + \frac{64}{3} + \frac{70}{3} + \frac{76}{3} + \frac{82}{3} + \frac{88}{3} + \frac{94}{3} + \frac{100}{3} + \frac{106}{3} + \frac{112}{3} + \frac{118}{3} + \frac{124}{3} + \frac{130}{3} + \frac{136}{3} + \frac{142}{3} + \frac{148}{3} + \frac{154}{3} + \frac{160}{3} + \frac{166}{3} + \frac{172}{3} + \frac{178}{3} + \frac{184}{3} + \frac{190}{3} + \frac{196}{3} + \frac{202}{3} + \frac{208}{3} + \frac{214}{3} + \frac{220}{3} + \frac{226}{3} + \frac{232}{3} + \frac{238}{3} + \frac{244}{3} + \frac{250}{3} + \frac{256}{3} + \frac{262}{3} + \frac{268}{3} + \frac{274}{3} + \frac{280}{3} + \frac{286}{3} + \frac{292}{3} + \frac{298}{3} + \frac{304}{3} + \frac{310}{3} + \frac{316}{3} + \frac{322}{3} + \frac{328}{3} + \frac{334}{3} + \frac{340}{3} + \frac{346}{3} + \frac{352}{3} + \frac{358}{3} + \frac{364}{3} + \frac{370}{3} + \frac{376}{3} + \frac{382}{3} + \frac{388}{3} + \frac{394}{3} + \frac{400}{3} + \frac{406}{3} + \frac{412}{3} + \frac{418}{3} + \frac{424}{3} + \frac{430}{3} + \frac{436}{3} + \frac{442}{3} + \frac{448}{3} + \frac{454}{3} + \frac{460}{3} + \frac{466}{3} + \frac{472}{3} + \frac{478}{3} + \frac{484}{3} + \frac{490}{3} + \frac{496}{3} + \frac{502}{3} + \frac{508}{3} + \frac{514}{3} + \frac{520}{3} + \frac{526}{3} + \frac{532}{3} + \frac{538}{3} + \frac{544}{3} + \frac{550}{3} + \frac{556}{3} + \frac{562}{3} + \frac{568}{3} + \frac{574}{3} + \frac{580}{3} + \frac{586}{3} + \frac{592}{3} + \frac{598}{3} + \frac{604}{3} + \frac{610}{3} + \frac{616}{3} + \frac{622}{3} + \frac{628}{3} + \frac{634}{3} + \frac{640}{3} + \frac{646}{3} + \frac{652}{3} + \frac{658}{3} + \frac{664}{3} + \frac{670}{3} + \frac{676}{3} + \frac{682}{3} + \frac{688}{3} + \frac{694}{3} + \frac{700}{3} + \frac{706}{3} + \frac{712}{3} + \frac{718}{3} + \frac{724}{3} + \frac{730}{3} + \frac{736}{3} + \frac{742}{3} + \frac{748}{3} + \frac{754}{3} + \frac{760}{3} + \frac{766}{3} + \frac{772}{3} + \frac{778}{3} + \frac{784}{3} + \frac{790}{3} + \frac{796}{3} + \frac{802}{3} + \frac{808}{3} + \frac{814}{3} + \frac{820}{3} + \frac{826}{3} + \frac{832}{3} + \frac{838}{3} + \frac{844}{3} + \frac{850}{3} + \frac{856}{3} + \frac{862}{3} + \frac{868}{3} + \frac{874}{3} + \frac{880}{3} + \frac{886}{3} + \frac{892}{3} + \frac{898}{3} + \frac{904}{3} + \frac{910}{3} + \frac{916}{3} + \frac{922}{3} + \frac{928}{3} + \frac{934}{3} + \frac{940}{3} + \frac{946}{3} + \frac{952}{3} + \frac{958}{3} + \frac{964}{3} + \frac{970}{3} + \frac{976}{3} + \frac{982}{3} + \frac{988}{3} + \frac{994}{3} + \frac{1000}{3} = 14$$

جواب صغی آخر...

$$an^2 + bn + c \rightarrow \frac{1}{2}x - 14 \Rightarrow -\frac{1}{2} = a$$

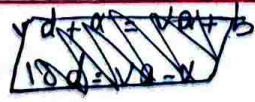
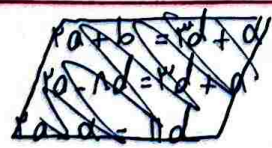
سوال 4 (2)

$$-25a - 5b - c = -14 \rightarrow 5x - c = -14 \Rightarrow c = -1$$

$$\frac{f_1}{f_2} = \frac{f(-\frac{1}{2}) \times 118 + (f \times 18) - 1}{(-1 \times \frac{1}{2}) \times 1 + (f \times 1) - 1} = \frac{14}{\frac{14}{8}} = 8 \checkmark$$

$$25a + 2b = 3, 2$$

$$-5, 18 + 2b = 3, 2 \Rightarrow b = 4$$



سوال 5 (2)

$$an + b \Rightarrow \text{توالی}$$

$$(n-1)d + a \Rightarrow \text{نسبت متناهی}$$

$$3d + a = 2a + b$$

$$vd + a = va + b$$

$$rd = 8a \Rightarrow \frac{r}{8}d = a \text{ (I)}$$

$$1 \cdot a = -b \Rightarrow \text{جمله سطر}$$

$$\rightarrow -nd = +b$$

$$\frac{f_1}{d} = \frac{an + b}{d} = \frac{18a - 18d}{d} \Rightarrow \frac{18 \times \frac{r}{8}d - 18d}{d} = r \checkmark$$

$$4(a+d)^r = 2a(a+rd) + 3a(a+d) \Rightarrow ra^r + rd^r + rad = 2a^r + 1.0d + 3a^r + 3ad$$

$$4d^r - 2a^r - ad = 0 \xrightarrow{\text{تنقسم بر } d} 4 - \frac{2a^r}{d^r} - \frac{a}{d} = 0 \xrightarrow{t = \frac{a}{d}} 4 - 2t^r - t = 0 \Rightarrow 2t^r + t - 4 = 0 \Rightarrow t^r + t - 2 = 0$$

$$(t-1)(t+2) \Rightarrow t = \frac{1}{2} \text{ or } -2$$

$$\frac{rd+a}{d} = r+t \quad | \quad r-2 \Rightarrow \textcircled{1} \checkmark$$

$$1 \cdot \frac{1}{2} + \frac{1}{2} \Rightarrow \left(\frac{1}{2}\right) \checkmark$$

$$\begin{aligned} &rb = ac \\ &a^r = bc \end{aligned} \Rightarrow \frac{rb}{bc} = \frac{a+c}{a^r} \Rightarrow \frac{r}{c} = \frac{a+c}{a^r} \Rightarrow ra^r = ca + c^r$$

$$ra^r - c^r - ca = 0 \xrightarrow{c = \frac{a}{t}} \frac{ra^r}{c^r} - \frac{a}{c} - 1 \xrightarrow{\frac{a}{c} = t} rt^r - t - 1 \Rightarrow t^r - t - 1$$

$$\begin{aligned} &\xrightarrow{(t-1)} t = \frac{r}{r} \\ &\xrightarrow{(t+1)} t = \frac{1}{r} \end{aligned}$$

$$\frac{a}{c} = \frac{r}{r} \Rightarrow a = c \quad \text{و } \bar{c} \bar{c} \bar{c}$$

$$\frac{a}{c} = \frac{1}{r} \Rightarrow ra = c \quad \bar{c} \bar{c} \bar{c} (I) \quad b, \frac{a}{r}, \frac{c}{r} \xrightarrow{I} b, \frac{a}{r}, \frac{a}{r} \Rightarrow q = \frac{a}{\frac{a}{r}} = r \Rightarrow r = r \checkmark$$

$$\begin{aligned} &rb + c = ra \xrightarrow{I} rb + c = \frac{rb}{c} \Rightarrow rbc + c^r = \frac{rb}{c} \Rightarrow rb - rbc - c^r = \frac{rb}{c} \\ &\boxed{ac = b^r \Rightarrow a = \frac{b^r}{c}} \xrightarrow{I} \frac{rb}{c^r} - \frac{rbc}{c^r} - 1 \xrightarrow{\frac{a}{c} = t} rt^r - rt - 1 \Rightarrow t^r - rt - 1 \end{aligned}$$

$$\begin{aligned} &t = \frac{a}{c} = 1 \Rightarrow a = c \quad \bar{c} \bar{c} \bar{c} \\ &t = \frac{a}{c} = \frac{1}{r} \Rightarrow ra = -c \quad \bar{c} \bar{c} \bar{c} \end{aligned}$$

$$c = -ra \xrightarrow{ra} q = \frac{-ra}{ra} = -1$$

$$\frac{t_1}{t_4} = q^r \Rightarrow (-r)^r = \dots$$

جواب صفی بعد ...

$$\boxed{\frac{a^r}{aq} \Rightarrow \frac{a}{q}} \quad \frac{aq^r}{a^r q^r} + \frac{aq}{a^r} = r \Rightarrow \frac{q^r}{a^r} + \frac{q}{a} = r \xrightarrow{\frac{a}{q} = t} t^r + t - r \Rightarrow (t+r)(t-1)$$

$$t = 1 \Rightarrow \frac{q}{a} = 1 \Rightarrow \textcircled{A} a = q \quad t = -r \Rightarrow \frac{q}{a} = -r \Rightarrow \textcircled{B} -ra = q \quad \frac{a}{q} = \frac{a}{a} = 1 / \frac{a}{-ra} = -\frac{1}{r} \checkmark$$

$$(\sqrt{aq^r} = aq^r)^r \Rightarrow aq^r = a^r q^r \Rightarrow aq = 1$$

$$aq^r = r \vee \Rightarrow \frac{aq^r}{aq} = \frac{r \vee}{aq} \Rightarrow q^r = r \vee \Rightarrow \boxed{q = r} \quad \boxed{a = \frac{1}{r}} \checkmark$$

$$\frac{1}{r} - \frac{1}{r} \Rightarrow \left(\frac{1}{r}\right) \checkmark$$

$a_0, a_2, a_4, a_6 \rightarrow$ ضابطه اول

(۳)

$a_1, a_3, a_5 \rightarrow$ ضابطه دوم

$a_2, a_4, a_6 \rightarrow$ ضابطه سوم

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

جمع جملات خواسته شده از ضابطه سوم بدست میاد:

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

میاد بیرون

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

$$a, b = aq, c = aq^2$$

(۸)

$$3aq, 2a, aq^2 \rightarrow \text{واسطه} = \frac{3aq + aq^2}{2} = 2a$$

$$aq^2 + 3aq - 4a = 0 \rightarrow (q+4)(q-1) = 0 \rightarrow \begin{cases} q = -4 \\ q = 1 \end{cases} \times \text{جملات متمایز}$$

$$\frac{a_9}{a_4} = q^5 = -4^5$$