

① ② ③ ④ ⑤
 1^2 2^2 3^2 4^2 5^2 $\Rightarrow [48 \dots 11] \rightarrow \frac{48+11}{2} = \frac{V_{av}}{2}$

$$a_k = \frac{1}{3} L_k, \quad a_1 = 1, \quad L_1 = 3 \quad \textcircled{1} \quad (121 + 363) \div 3 = 484 \div 3 = 161 \frac{1}{3}$$

$$a_{k+1} = L_{k+1} \quad a_Y = f \quad L_Y = 1_Y \quad (Y)$$

$$a_\psi = 1^\psi \quad L_\psi = \psi a \quad \textcircled{\psi}$$

$$a_F = F, \quad 2_F = 12. \quad (F)$$

$a_2 = 121$ $L_2 = 121$ (8)

Q

Q

$$a = c + \gamma r \quad b = c + r \quad \frac{a/\gamma}{c/\gamma} = a \quad \frac{b}{a/\gamma} = a$$

$$(c + \gamma r)^\gamma = (c + r)c \Rightarrow c^\gamma + \gamma c r + \gamma r^\gamma = c^\gamma + c r$$

$$\gamma c r + \gamma r^\gamma = 0 \Rightarrow r(\gamma c + \gamma r) = 0 \quad \gamma c + \gamma r = 0 \Rightarrow r = -\frac{\gamma}{\gamma} c \Rightarrow$$

$$r \neq 0 \quad a = c + \gamma r = c - \frac{\gamma}{\gamma} c = -\frac{1}{\gamma} c \quad a = \frac{a/\gamma}{c/\gamma} = \frac{(-\frac{1}{\gamma} c)}{\frac{1}{\gamma} c} = -1 \quad \boxed{-1}$$

$$a = c q^\gamma \quad b = c q$$

$$a^\gamma - c = b - a^\gamma \quad (c q^\gamma)^\gamma - c = (c q)^\gamma - (c q^\gamma)^\gamma$$

$$\cancel{c^\gamma q^{\gamma^2}} = c^\gamma q^{\gamma^2} - c^\gamma q^\gamma - c = 0$$

$$\frac{a q^\gamma}{a^\gamma q^\gamma} + \frac{a q}{a^\gamma} = \gamma \quad \frac{q^\gamma}{a^\gamma} + \frac{q}{a} = \frac{a q + q^\gamma}{a^\gamma} = \frac{a \gamma + q^\gamma}{a^\gamma} = \gamma$$

$$\frac{a \gamma}{a^\gamma} + \frac{q^\gamma}{a^\gamma} = \gamma \Rightarrow \frac{a \gamma}{a^\gamma} = \gamma - \frac{q^\gamma}{a^\gamma} \Rightarrow \frac{a}{a^\gamma} = \frac{1}{\gamma - \frac{q^\gamma}{a^\gamma}}$$

$$a \gamma = A r^\gamma \quad A r^\gamma = \sqrt{A r^\gamma} \quad a \gamma = A r^\gamma \quad A r = 1 \quad A > 0, r > 0$$

$$A = 1/r \quad a \gamma = A r^\gamma = \gamma \gamma \quad A = 1/\gamma \quad r^\gamma = \gamma \gamma \rightarrow r = \gamma$$

$$\frac{1}{\gamma} - A = \frac{1}{\gamma} - \frac{1}{\gamma} = \frac{1}{\gamma} \quad \checkmark$$

$$\begin{cases} a_0 = 1 \\ a_2 = 2 \\ a_4 = 4 \\ a_6 = 8 \end{cases} \quad \begin{cases} a_1 = 1 \\ a_3 = 2 \\ a_5 = 0 \end{cases}$$

سوال ۳

اول ← a_0, a_2, a_4, a_6

دوم ← a_1, a_3, a_5

سوم ← a_2, a_4, a_6

$$\begin{cases} a_2 = a+1 \\ a_4 = a+1 \\ a_6 = a+2 \end{cases}$$

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

جمع جلات $a_2 + a_4 + \dots$ از جمله سوم :

$$a_n = \left\lfloor \frac{n}{k+2} \right\rfloor + a \xrightarrow{n=3k+2} \left\lfloor \frac{3k+2}{k+2} \right\rfloor - 2 \rightarrow a_n = \left\lfloor \frac{2(k+2)}{k+2} + \frac{k-2}{k+2} \right\rfloor - 2$$

$$\rightarrow S_n = \left\lfloor 2 + \frac{k-2}{k+2} \right\rfloor - 2 = \frac{k-2}{k+2}$$

عبارت $\left\lfloor \frac{k-2}{k+2} \right\rfloor$ به ازای $k=0, k=1$ برابر ۱- است، به ازای سایر اعداد حسابی برابر صفر است :

$$\sum_{k=0}^4 \left\lfloor \frac{k-2}{k+2} \right\rfloor = -2$$

$$t_n = an^r + bn + c \rightarrow \begin{cases} t_{10} = 10^r a + 10b + c = 14 \\ t_1 = 1^r a + 1b + c = 14/2 \end{cases} \rightarrow \begin{cases} 10^r a + 10b = 14 \\ 10^r a + b = 7 \end{cases}$$

سوال ۴

$$a = \frac{1}{10^r} (-t_{10}) = \frac{1}{10^r} (-14) = -\frac{1}{10} \rightarrow a = -\frac{1}{10}$$

$$b = 4, c = -1$$

$$t_{10} = -\frac{1}{10} (10)^r + 4(10) - 1 = 14$$

$$\frac{t_{10}}{t_1} = \frac{14}{7} = 2$$

$$t_1 = -\frac{1}{10} (1)^r + 4(1) - 1 = 7/2$$

سوال ۵

$$a_f = b_r \rightarrow a_1 + f d = b_r \rightarrow f d = b_r - b_1$$

$$a_n = b_v \rightarrow a_1 + v d = b_v$$

$$b_n = c_n + k \rightarrow b_v - b_r = (v c + k) - (r c + k) = \omega c$$

$$\rightarrow \omega c = f d$$

$$b_1 = 0 \rightarrow 1 \cdot c + k = 0 \rightarrow k = -1 \cdot c$$

$$\frac{b_{10}}{d} = \frac{1 \omega c + k}{d} \rightarrow \frac{1 \omega c - 1 \cdot c}{d} = \frac{\omega c}{d} = \frac{f d}{d} \rightarrow \frac{b_{10}}{d} = f$$

سوال 4

$$a_r = a + d \rightarrow r(a+d)^r = \omega a(a+rd) + r a(a+d)$$

$$ra^r + rd^r + 1rad = \omega a^r + \omega ad + ra^r + rad \rightarrow ra^r + ad - rd^r = 0$$

$$a = \frac{-d \pm \sqrt{d^r - r(r)(-rd^r)}}{r} = \frac{-d \pm \sqrt{r^2 d^r}}{r} = \frac{-d \pm rd}{r} \rightarrow \begin{cases} a = -rd \\ a = \frac{rd}{r} \end{cases}$$

$$a = -rd \rightarrow \frac{a_r}{d} = \frac{a_1 + rd}{d} = \frac{d}{d} = 1$$

$$a = \frac{rd}{r} \rightarrow \frac{a_r}{d} = \frac{a_1 + rd}{d} = \frac{\frac{rd}{r}}{d} = \frac{r}{d}$$

سوال 1

q

$$a, b, c \xrightarrow{\text{مربع کنیم}} a, aq, aq^r$$

$$ra, ra, c \xrightarrow{\text{مربع کنیم}} raq, ra, aq^r \xrightarrow{\text{نسبت}} \frac{raq + aq^r}{r} = ra \rightarrow raq + aq^r = ra$$

$$aq^r + raq - ra = 0 \xrightarrow{\div a} q^r + rq - r = 0 \rightarrow (q+r)(q-1) = 0 \rightarrow \begin{cases} q = 1 \text{ } \times \text{ حالت مستقیم } \\ q = -r \end{cases}$$

$$\frac{a_q}{a_r} = \frac{aq^r}{aq^{\omega}} = q^r \rightarrow \boxed{\frac{a_q}{a_r} = -r}$$