

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

(سوال اول)

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

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

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

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

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

$$\text{میانگین} = \frac{\text{مجموعه}}{\text{تعداد}}$$

(سوال دوم)

$$\{1, 2, 3\}, \{4, 5, \dots, 12\}, \{13, 14, \dots, 24\}, \{25, 26, \dots, 36\}, \{37, 38, \dots, 48\}$$

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

(سوال سوم)

$$a_1 + a_2 + a_3 + a_4 + a_5 + a_6 + a_7 + a_8 + a_9 + a_{10} = 14$$

$$a_1 = 4$$

$$a_1 + a_2 + 1 + 1 + (\frac{d}{2} + a) + 1 + 0 + (1 + a) + 1 = 14$$

$$a_2 = \frac{1}{2} + a$$

$$a_1 + 2a + a_2 = \frac{1}{2} \Rightarrow 1 + 2a + \frac{1}{2} = \frac{1}{2} \Rightarrow 2a = -\frac{1}{2} \Rightarrow a = -\frac{1}{4}$$

$$a_2 + a_5 + a_8 + a_{11} + a_{14} + a_{17} + a_{20} + a_{23} + a_{26} + a_{29}$$

$$\frac{10a + a}{10} + 1 + (\frac{d}{2} + \frac{1}{2} + \frac{1}{2} + \frac{1}{2} + \frac{1}{2} + \frac{1}{2} + \frac{1}{2} + \frac{1}{2} + \frac{1}{2} + \frac{1}{2})$$

$$10 + \frac{d}{2} + \frac{1}{2} + \frac{1}{2} + \frac{1}{2} + \frac{1}{2} + \frac{1}{2} + \frac{1}{2} + \frac{1}{2} + \frac{1}{2}$$

(سوال چهارم)

$$an^2 + bn + c$$

$$\frac{1}{2}x - 14 \Rightarrow -\frac{1}{2} = a$$

$$-25a - 5b - c = -14$$

$$+ 49a + 7b + c = 14, 2$$

$$25a + 2b = 28$$

$$-49a + 2b = 28 \Rightarrow b = 28$$

$$\frac{f_1}{f_2} = \frac{(-\frac{1}{2}) \times 25 + (2 \times 10) - 1}{(-\frac{1}{2}) \times 1 + (2 \times 1) - 1} = \frac{14}{\frac{1}{2}} = 28$$

(سوال پنجم)

$$an + b \Rightarrow \text{توالی}$$

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

$$\begin{matrix} a+b = a+d \\ a+d = a+2d \\ a+2d = a+3d \\ \vdots \\ a+(n-1)d = a+nd \end{matrix}$$

$$\begin{matrix} a+d = a+b \\ a+b = a+c \\ a+c = a+d \\ \vdots \\ a+(n-1)d = a+b \end{matrix}$$

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

$$vd + a = va + b$$

$$rd = 5a \Rightarrow \frac{r}{5}d = a \text{ (I)}$$

$$10a = -b \Rightarrow \text{نسبت}$$

$$\rightarrow -10d = -b$$

$$\frac{f_1}{d} = \frac{an+b}{d} = \frac{10a - 10d}{d} \Rightarrow \frac{10 \times \frac{r}{5}d - 10d}{d} = r$$

$$\begin{aligned} \gamma(a+rd)^r &= \partial a(a+rd) + ra(a+d) \Rightarrow ra^r + rd^r + rad = \partial a^r + 1.ad + ra^r + rad \\ rd^r - ra^r - ad &= 0 \xrightarrow{\text{تقسيم بر } d} r\frac{d^r}{d^r} - \frac{ad^r}{d^r} - \frac{a}{d} = 0 \xrightarrow{t=\frac{g}{d}} r-t^r-t=0 \Rightarrow rt+t-g=0 \Rightarrow t+r-1r=0 \\ (t-r)(t+r) &\Rightarrow t = \frac{r}{r}-r && \frac{rd+a}{d}=r+\frac{a}{d} \quad / \quad r-r \Rightarrow ① \\ &&& / \quad r+\frac{r}{r} \Rightarrow (\frac{q}{r}) \end{aligned}$$

$$\begin{aligned} & \left. \begin{aligned} r^b &= ac \\ a^r &= bc \end{aligned} \right] \rightarrow \frac{r^b}{bc} = \frac{a+c}{a^r} \Rightarrow \frac{r}{c} = \frac{a+c}{a^r} \Rightarrow ra^r = ca + c^r \quad (VJ15) \\ & ra^r - c^r - ca = 0 \xrightarrow{C \neq 0} \frac{ra^r}{c^r} - \frac{a}{c} - 1 \xrightarrow{\frac{a}{c} = t} rt^r - t - 1 \Rightarrow t^r - t - 1 \begin{cases} (t-r) \Rightarrow t = \frac{r}{r} \\ (t+1) \Rightarrow t = -\frac{1}{r} \end{cases} \\ & \frac{a}{c} = \frac{r}{r} \Rightarrow a = c \quad \bar{0} \bar{0} \bar{E} \\ & \frac{a}{c} = \frac{1}{r} \Rightarrow ra = c \quad \bar{0} \bar{0} (I) \quad b, \frac{a}{r}, \frac{c}{r} \xrightarrow{I} b, \frac{a}{r}, \frac{a}{r} \Rightarrow q = \frac{a}{\frac{r}{a}} = 1 \Rightarrow \underline{rq = r} \end{aligned}$$

$$r_b + c = r_a \xrightarrow{I} r_b + c = \frac{r_b}{c} \Rightarrow r_b c + c^r = r_b^r \Rightarrow r_b^r - r_b c - c^r = 0$$

$$ac = b^r \Rightarrow a = \frac{b^r}{c} (I) \quad + \frac{b^r}{cr} - \frac{r_b c}{c^r} - 1 \xrightarrow{+t} t^r - r_t - 1 \rightarrow t^r - r_t - r \rightarrow (t-r) \Rightarrow t=1$$

$$t = \frac{a}{c} = 1 \Rightarrow a = c \quad \bar{0} \bar{0} \bar{1}$$

$$t = \frac{a}{c} = \frac{1}{r} \Rightarrow r_a = -c \quad \bar{0} \bar{0}$$

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

$$\frac{t_9}{t_4} = q^r \Rightarrow (-r)^w = -1$$

$$\frac{a^r}{aq} \Rightarrow \frac{a}{q} \quad \frac{aq^8}{a^r q^r} + \frac{aq}{a^r} = r \Rightarrow \frac{q^r}{a^r} + \frac{q}{a} = r \xrightarrow{q=t} t^r + t - r \Rightarrow (t+r)(t-1) \quad (q \neq 1)$$

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

سوال ۱۰

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

$$aq^r = rV \Rightarrow \frac{aq^r}{aq} = \frac{rV}{aq} \Rightarrow q^r = rV \Rightarrow \boxed{q = r} \quad \boxed{a = \frac{1}{r}} \quad \text{[} aq = 1 \text{]}$$

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