

$$\begin{aligned} a_1 &= 4 \\ a_{14} &= 91 \end{aligned} \quad a_{14} - a_1 = 13d \Rightarrow 13d = 91 - 4 = 87 \Rightarrow d = 7 \quad \left. \begin{aligned} a_n &= (n-1)d + a_1 \\ &= (n-1) \times 7 + 4 \\ &= 7n + 3 \end{aligned} \right\}$$

$$a_n = 7n + 3 = 111$$

$$7n = 108$$

$$(n = 15) \rightarrow \text{پاسخ} \rightarrow 15 \text{ تا}$$

$$a_n = 7n + 3 \Rightarrow 1 \leq 7n + 3 \leq 999$$

$$97 \leq 7n \leq 996$$

$$n \in \mathbb{N} \quad 14, 1 \leq n \leq 142, 2$$

$$14 \leq n \leq 142 \Rightarrow (142 - 14) + 1 = 129 \rightarrow \text{پاسخ}$$

$$\begin{aligned} (nd + a_1) + (nd + d + a_1) + (nd + 2d + a_1) &= -9n + 12 \rightarrow (3d)n = -9n \Rightarrow d = -3 \\ 3a_1 + 3d + (3d)n &= -9n + 12 \quad \text{رابطه میانی} \\ d = -3 \Rightarrow 3a_1 + (-9) &= 12 \Rightarrow a_1 = 7 \end{aligned}$$

$$a_{14} + a_n = a_1 + 13d + a_1 + 7d = 2a_1 + 20d = 12 + (-60) = -48 \rightarrow \text{پاسخ}$$

$$\begin{aligned} a_n + a_n &= a_r + a_{13} \Rightarrow 2a_n = a_r + a_{13} \Rightarrow 2 \times r^{n-1} = r^{r-1} + r^{12-1} \\ \Rightarrow r \times r^n &= r \times r^{r-1} + r^{11} \Rightarrow r^n = r^r = r^{11} \Rightarrow n = r = 11 \\ \Rightarrow a_r + a_n + a_{13} &= (r-1) + (n-1) + (12-1) = 21 \rightarrow \text{پاسخ} \end{aligned}$$

$$a_{13} - a_1 = 12d = 5 \Rightarrow d = 5, 12$$

$$a_{13} + a_1 = 11d + a_1 + 9d + a_1 = 20d + 2a_1 = 20 \Rightarrow 5 \times 2 + 2a_1 = 20 \Rightarrow a_1 = 5$$

$$a_{11} = 10d + a_1 = 50 + 5 = 55 \rightarrow \text{پاسخ}$$

$$\left. \begin{aligned} a_1 + a_r + \underline{a_r} + a_r + a_d &= \omega a_r \\ a_r + a_v + \underline{a_n} + a_q + a_1 &= \omega a_n \end{aligned} \right\} \Rightarrow \omega a_r = \omega a_n \times \frac{1}{r} \\ r a_r = a_n \Rightarrow r(a_1 + r d) = a_1 + \omega d \\ \Rightarrow r a_1 + r^2 d = a_1 + \omega d \Rightarrow \underline{r a_1 = d}$$

$$\left. \begin{aligned} a_1 &= a_1 \\ a_r &= a_1 + d = a_1 + r a_1 = r a_1 \end{aligned} \right\} \frac{a_r}{a_1} = \frac{r a_1}{a_1} = r \rightarrow \text{جواب}$$

$$t_1 + (n-1)d = t_1 + (n-r)d + 1\omega \Rightarrow n d - d = n d - r d + 1\omega \Rightarrow \boxed{r d = 1\omega} \\ \boxed{d = \omega} \\ t_1^r - t_0^r = (t_1 + r d)^r - (t_1 + r_0 d)^r = t_1^r + r \omega + 1\omega t_1 - t_1^r - r_0 - r_0 t_1 = 1\omega + r_0 t_1$$

$$\frac{1\omega + r_0 t_1}{t_1 + r_0 d} = \frac{r_0 t_1 + 1\omega}{t_1 + r_0} = \frac{r_0 (t_1 + r_0)}{t_1 + r_0} = r_0 \rightarrow \text{جواب}$$

$$a = r(1 - \sqrt{r})$$

$$b = r + \sqrt{r}$$

$$d = \frac{b-a}{n+1} = \frac{r + \sqrt{r} - r + 1\sqrt{r}}{1\sqrt{r}} = \frac{1\sqrt{r}}{1\sqrt{r}} = \sqrt{r} \rightarrow \text{جواب}$$

$$d = \frac{r r - r}{r n - r + 1} = \frac{r}{r n - r} = \frac{1\omega}{r n - 1} \left\{ n^{\text{شماره}} = a_{n+1} = n d + a_1 \right.$$

$$\Rightarrow n \frac{1\omega}{r n - 1} + r = 1 \Rightarrow \frac{1\omega n}{r n - 1} = 1 - r \Rightarrow 1\omega n = 1\omega n - 1 - r \Rightarrow \underline{r n = 1}$$

$$(n = 1) \rightarrow \text{جواب}$$

$$a_n + a_{n,r} = a_1 + (n-1)d + a_1 + (n+r)d = a_r + a_n \Rightarrow r a_1 + r n d + r d = r a_1 + n d \\ \Rightarrow r n d = 1\omega d \Rightarrow \boxed{n = 1} \left\{ a_1 = r a_1 \Rightarrow a_1 = r a_r \Rightarrow a_1 + \omega d = r(a_1 + r d) \right.$$

$$\Rightarrow a_1 + \omega d = r a_1 + r^2 d \Rightarrow a_1 = -d \Rightarrow \underline{a_1 + d = 0}$$

$$\boxed{r = 1\omega}$$