

$$d = \frac{91.4}{r-1} = \frac{21}{r} = V$$

$$t_x = 201 = t_1 + xd \Rightarrow xd = 191 \Rightarrow x = \frac{191}{V} = 24$$

$$t_1 + 24d = \boxed{t_{25}}$$

۱

$$\frac{100 \sqrt{V}}{r} \rightarrow \frac{101 \sqrt{V}}{r} \Rightarrow t_1 = 101, d = V \Rightarrow t_n = Vn + 94$$

$$t_n < 1000 \Rightarrow Vn + 94 < 1000 \Rightarrow Vn < 906 \Rightarrow n < 129.4 \xrightarrow[\text{برای } n]{\text{بیشتر مقدار}} n = \boxed{129}$$

۲

$$2b = a + c \Rightarrow 2a_{n+2} + a_{n+2} = -9n + 12 \Rightarrow 3a_{n+2} = -9n + 12 \Rightarrow a_{n+2} = -3n + 4$$

$$\Rightarrow a_{6+2} = -3(6) + 4 \Rightarrow a_8 = -14$$

$$\Rightarrow a_{12+2} = -3(12) + 4 \Rightarrow a_{14} = -32$$

$$\Rightarrow a_{14} + a_8 = -14 - 32 = \boxed{-46}$$

۳

$$2b = a + c \Rightarrow r^{x+2} = r^x - 1 + r^x - 3 \Rightarrow r^{x+2} = 2r^x - 2 \Rightarrow x = 2$$

$$\Rightarrow t_2 = r^2 - 1 = r^2 - 1 = 2$$

$$\Rightarrow t_4 = r^{2+1} = r^3 - 1 = 7$$

$$\Rightarrow t_6 = r^{2+2} = r^4 - 1 = 15$$

$$\Rightarrow t_2 + t_4 + t_6 = 2 + 7 + 15 = \boxed{24}$$

۴

$$t_{12} - t_{10} = \omega \Rightarrow t_1 + 11d - (t_1 + 9d) = \omega \Rightarrow t_1 + 11d - t_1 - 9d = \omega \Rightarrow 2d = \omega \Rightarrow d = \frac{\omega}{2}$$

$$t_{12} + t_{10} = 2\omega \Rightarrow t_1 + 11d + t_1 + 9d = 2\omega \Rightarrow 2t_1 + 20d = 2\omega \Rightarrow 2t_1 + 20(\frac{\omega}{2}) = 2\omega$$

$$\Rightarrow 2t_1 = -2\omega \Rightarrow t_1 = -\frac{12}{\omega}$$

$$\Rightarrow t_{11} = t_1 + 20d = -\frac{12}{\omega} + 20(\frac{\omega}{2}) = -\frac{12}{\omega} + \omega = \boxed{\frac{37\omega}{6}}$$

۵

$r(t_1 + t_2 + t_3 + t_4 + t_5) = r(t_1 + t_2 + t_3 + t_4 + t_5) \Rightarrow r t_1 + r t_2 + r t_3 + r t_4 + r t_5 = r t_1 + r t_2 + r t_3 + r t_4 + r t_5$ $+ r t_1 + r t_2 + r t_3 + r t_4 = t_1 + 2d + t_2 + 3d + t_3 + 4d + t_4 + 5d = 1 \wedge t_1 + r d =$ $\Delta t_1 + r \Delta d \Rightarrow 1 r t_1 = -1 d \Rightarrow t_1 = -\frac{1}{r} d$ $\xrightarrow{\text{substituting}} 1, r, 1, d, V, \dots \Rightarrow t_2 = \boxed{r}$	6
$t_n = t_{n-r} + 1 \wedge \xrightarrow{n=r} t_r = t_1 + 1 \wedge \left. \begin{array}{l} t_r = t_1 + 1 \wedge \\ t_r = t_1 + r d \end{array} \right\} \Rightarrow r d = 1 \wedge \Rightarrow d = \frac{1}{r}$ $\Rightarrow t_n = t_{n-r} + 1 \wedge \Rightarrow t_n = t_{n-r} + r d + 1 \wedge \Rightarrow t_n = t_n$ $\Rightarrow \frac{t_n - t_1}{t_r - t_1} = \frac{(r d)^r - (1 d)^r}{r d - 1 d} = \frac{1 d^r - r \Delta d^r}{r d} = \frac{2 r d^r}{r d} = 1 \wedge d = 1 \times d = \boxed{r_0}$	7
$r(1 - \sqrt{r}) = r - 1 \sqrt{r}, \dots, r + \sqrt{r}$ $r + \sqrt{r} - r + 1 \sqrt{r} = 1 \sqrt{r}$ $d = \frac{1 \sqrt{r}}{1 r} = \boxed{\sqrt{r}}$	8
$d = \frac{r r r}{r_{n-r}} = \frac{r_0}{r_{n-r}} = \frac{1 \wedge}{r_{n-1}} \left[\begin{array}{l} \rightarrow n=1 \Rightarrow d=1 \wedge: r, 1, V, r r \propto \\ \rightarrow n=r \Rightarrow d=\frac{1}{r}: r, V, 1, r, \dots, r r \propto \\ \rightarrow n=r \Rightarrow d=r: r, \Delta, 1, 1, 1, \dots, r r \checkmark \Rightarrow n = \boxed{r} \end{array} \right.$	9
$t_a + t_d = t_b + t_c \Rightarrow t_r + t_v = t_n + t_{n+r} \Rightarrow r + 1 V = n + (n + r) \Rightarrow 2n + r = r_0 \Rightarrow 2n = r_0 - r \Rightarrow n = \frac{r_0 - r}{2}$ $t_n = r t_{\frac{n}{r}} \Rightarrow t_n = r t_r \Rightarrow t_1 + V d = r(t_1 + r d) \Rightarrow t_1 + V d = r t_1 + r^2 d \Rightarrow r t_1 = -r d$ $\Rightarrow t_1 = -d$ $t_n = t_1 + n d \Rightarrow t_n = -d + n d \Rightarrow t_n = d(n-1)$ $t_n = 0 \Rightarrow d(n-1) = 0 \Rightarrow n-1 = 0 \Rightarrow n = 1 \Rightarrow \boxed{t_1 = 0}$	10