

$$t_1 = 15$$

$$t_r = 91 \rightarrow t_1 + 2d = 91 \rightarrow 2d = 76 \rightarrow d = 38$$

$$t_n = 179$$

$$\begin{aligned} v_n + 22d &= 179 \\ v_n &= 179 \\ n &= 179 \end{aligned}$$

(1)

$$\begin{aligned} t_1 &= 101 \\ t_r &= 101 \\ &\vdots \\ t_n &= 997 \end{aligned}$$

$$v_n + 91d = 997$$

$$\begin{aligned} v_n + 91d &= 997 \\ v_n &= 907 \\ n &= 179 \end{aligned}$$

$$t_{179} \leq t_1 \rightarrow 179$$

(2)

$$n=1 \rightarrow a_1 + a_2 + a_3 = 9 \rightarrow 3a_1 + 3d = 9$$

$$n=2 \rightarrow a_1 + a_2 + a_3 = 0 \rightarrow 3a_1 + 6d = 0$$

$$-3d = 9 \rightarrow d = -3, a = 3$$

$$a_{17} + a_{18} = 2a_1 + 22d = -22$$

(3)

$$t_r = 1^2 - 1 \rightarrow 0$$

$$t_1 = 1^2 + 1 \rightarrow 2$$

$$t_{17} = 17^2 - 1 \rightarrow 288$$

$$b = \frac{a+c}{2}$$

$$1^2 \times 17 = \frac{1^2 + 17^2 - 1}{2} \rightarrow 17^2 + 1 = 1^2 + 17^2 - 1$$

$$1 - 17^2 + 17^2 + 1 = 0 \rightarrow 17^2 \times 1 - 17^2 - (1^2) + 1 = 0$$

$$17 + 1 + 0 = 18$$

(4)

$$t_{10} - t_{17} = 0 \rightarrow 2d = 0 \rightarrow d = 0$$

$$t_{10} + t_{17} = 18 \rightarrow 2t_1 + 20d = 18 \rightarrow 2t_1 = 18 - 0 = 18 \rightarrow t_1 = 9$$

$$t_{17} = t_1 + 16d = 9 + 0 = 9$$

(5)

$$a \quad a+d \quad a+2d \quad a+3d \quad a+4d \quad a+5d \quad a+6d \quad a+7d \quad a+8d \quad a+9d$$

$$\frac{a + 10d}{a + 15d} = \frac{1}{2} \rightarrow 2a + 20d = a + 15d \rightarrow a = -5d \rightarrow d = 2a$$

$$\frac{a_r}{a_1} = \frac{a_1 + d}{a_1} = \frac{10a}{a} = 10$$

(6)

$$t_n = t_{n-1} + 10$$

$$n=5 \rightarrow t_5 = t_4 + 10 \rightarrow t_1 + 4d - t_1 - d = 10 \rightarrow 3d = 10 \rightarrow d = 10/3$$

$$n=9 \rightarrow t_9 = t_8 + 10$$

$$n=3 \rightarrow t_3 = 10 \rightarrow t_1 = 0$$

$$\frac{t_9 - t_5}{t_5} = \frac{10 - 10}{10} = 0$$

(7)

$$r(1-\sqrt{r}), \dots, r+\sqrt{r}$$

(1)

$$d = \frac{b-a}{n+1} \rightarrow \frac{r+\sqrt{r}-r+12\sqrt{r}}{13} = \frac{13\sqrt{r}}{13} = \sqrt{r}$$

$$r, \dots, 11, 13r$$

(9)

$$\begin{aligned} a(n+1) &= r+nd=11 \\ nd &= 9 \end{aligned} \rightarrow \left. \begin{aligned} a(r_{n-1}) &= r+(r_{n-1}-r)d = 13r \\ (r_{n-1}-r)d &= 12r \end{aligned} \right\} \rightarrow \frac{r_{n-1}-r}{n} = \frac{12r}{9} = \frac{4r}{3} = \frac{10}{3} = n$$

$$\begin{aligned} t_r + t_{13} &= t_n + t_{n+12} \rightarrow r_0 = r_n + 12 \\ &\quad \downarrow \quad \downarrow \\ &\quad t_1 \quad t_{13} \end{aligned} \quad r_n = 13 \rightarrow n=1$$

مطلوب (10)

$$\frac{t_n}{t_{\frac{n}{2}}} = \frac{r}{1} \rightarrow \frac{t_1}{t_5} = \frac{r}{1} \rightarrow t_1 + 4d = r t_1 + 9d \rightarrow r t_1 = -r d$$

$$t_1 = -d$$

$$\begin{aligned} t_n &= t_1 + (n-1)d = 0 \\ -d + nd - d &= 0 \\ -2d + nd &= 0 \\ n &= 2 \end{aligned}$$