

$$t_1 = 15$$

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

$$t_n = 171 + 2d = 171 + 76 = 247$$

$$v_n + 2d = 170$$

$$v_n = 170$$

$$n = 170$$

✓

1

$$t_1 = 101$$

$$t_f = 101$$

$$\vdots$$

$$t_n = 99$$

$$v_n + 9d = 99$$

$$v_n + 9d = 99$$

$$v_n = 90$$

$$n = 170$$

$$t_{170} \leq t_1 \rightarrow 170$$

✓

2

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

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

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

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

$$17(3) + 2(-3) = -17$$

✓

3

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

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

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

$$17 + 1 + 0 = 18$$

✓

✓

4

$$t_{10} - t_{17} = 10 \rightarrow 10d = 10 \rightarrow d = 1$$

$$t_{10} + t_{17} = 10 \rightarrow 2t_1 + 17d = 10 \rightarrow 2t_1 = 10 - 17 = -7 \rightarrow t_1 = -3.5$$

$$t_{17} = t_1 + 16d = -3.5 + 16 = 12.5$$

$$12.5 + (-3.5) = 9$$

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

$$\frac{a + 10d}{a + 17d} = \frac{1}{2} \rightarrow 2a + 20d = a + 17d \rightarrow a = -3d \rightarrow d = 10$$

$$\frac{a_r}{a_1} = \frac{a_1 + d}{a_1} = \frac{10}{10} = 1$$

✓

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

$$n=10 \rightarrow t_{10} = t_1 + 9d \rightarrow t_1 + 9d - t_1 - d = 10 \rightarrow 8d = 10 \rightarrow d = 1.25$$

$$n=9 \rightarrow t_9 = t_1 + 8d$$

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

✓

$$\frac{t_9 - t_1}{t_1} = \frac{10 - 10}{10} = 0$$

5

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

(1)

$$d = \frac{b-a}{n+1} \rightarrow \frac{r+\sqrt{r}-r+1\sqrt{r}}{1^2} = \frac{1^2\sqrt{r}}{1^2} = \sqrt{r}$$

(P) ✓

$$r, \dots, 11, 3r$$

(9)

$$\begin{aligned} a(n+1) &= r+nd=11 \\ nd &= 9 \end{aligned} \rightarrow \left. \begin{aligned} a(r_{n-1}) &= r+(r_{n-1}-r)d = 3r \\ (r_{n-1}-r)d &= r_0 \end{aligned} \right\} \rightarrow \frac{r_{n-1}-r}{n} = \frac{r_0}{9} = \frac{10}{r} = n$$

(P) ✓

$$\begin{aligned} t_r + t_{14} &= t_n + t_{n+r} \\ \downarrow \quad \downarrow \\ t_1 \quad t_{11} \end{aligned} \rightarrow \begin{aligned} r_0 &= r_n + r \\ r_n &= 15 \Rightarrow n=1 \end{aligned}$$

مطلوب (10)

$$\frac{t_n}{t_{\frac{n}{2}}} = \frac{r}{1} \rightarrow \frac{t_1}{t_5} = \frac{r}{1} \rightarrow t_1 + 4d = 5t_1 + 9d \rightarrow rt_1 = -rd$$

$$t_1 = -d$$

(P) ✓

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