

$$d = \frac{t_n - t_m}{n - m} = \frac{41 - 20}{14 - 1} = \frac{21}{13} = \sqrt{\quad} \Rightarrow$$

$$t_n = 20 + (n-1) \times \sqrt{\quad} \Rightarrow 208 = 20 + (n-1) \times \sqrt{\quad} \Rightarrow \sqrt{\quad} n - \sqrt{\quad} = 148 \Rightarrow$$

$$\sqrt{\quad} n = 148 \Rightarrow n = \frac{148}{\sqrt{\quad}} = 25$$

✓ جمله بیست و پنجم

$$3, 10, 17, 24, \dots \Rightarrow t_n = 7n - 4 \Rightarrow$$

$$100 \leq 7n - 4 < 1000 \Rightarrow$$

$$104 \leq 7n < 1004 \Rightarrow \div 7$$

$$\frac{104}{7} \leq n < \frac{1004}{7} \Rightarrow n: 15, 16, 17, \dots, 143$$

$$\frac{143 - 15}{1} + 1 = 129$$

$$a_{n+1} + a_{n+2} + a_{n+3} = 3a_{n+2} = -4n + 12 \Rightarrow a_{n+2} = -2n + 4 \Rightarrow$$

$$a_1 + (n+1)d = -2n + 4 \Rightarrow a_1 + nd + d = -2n + 4 \Rightarrow \boxed{d = -2}$$

$$\Rightarrow a_1 - 2n - 2 = -2n + 4 \Rightarrow \boxed{a_1 = 6}$$

$$\left. \begin{array}{l} a_{14} = 6 + 13(-2) = -20 \\ a_{18} = 6 + 17(-2) = -28 \end{array} \right\} \Rightarrow a_{14} + a_{18} = -20 - 28 = -48$$

$$\frac{a_r + a_{13}}{2} = \frac{3a_8}{2} = a_8 \Rightarrow 2^{-1} + 2^{-3} = 2(2^{-1}) \Rightarrow$$

$$2^{-1} + 2^{-3} = 2 \times 2^{-1} \Rightarrow 2^{-1} - 2^{-3} = 2 \times 2^{-1}$$

$$\underline{2^{-1} = A}, A^2 - 2 = 2A \Rightarrow A^2 - 2A - 2 = 0 \Rightarrow (A-4)(A+1) = 0 \Rightarrow$$

$$\left. \begin{array}{l} 2^{-1} = 4 \checkmark \Rightarrow n=2 \\ 2^{-1} = -1 \times \end{array} \right\} \Rightarrow \text{مجموع این سه جمله} = 3 + 1 + 13 = 17$$

$$\left. \begin{array}{l} a_{12} - a_{10} = 0 \\ a_{12} + a_{10} = 20 \end{array} \right\} \Rightarrow 2a_{12} = 20 \Rightarrow a_{12} = 10 \Rightarrow a_{10} = 10 \Rightarrow$$

$$d = \frac{10 - 10}{12 - 10} = 0 \Rightarrow$$

$$a_{21} = a_{12} + 9d = 10 + (9 \times 0) = 10 + 0 = 10$$

$$\frac{\omega}{r}(a_1 + a_{10}) = \frac{1}{r} \times \frac{\omega}{r}(a_r + a_{10}) \Rightarrow a_r + a_{10} = r(a_1 + a_{10}) \Rightarrow$$

$$ra_1 = r \times ra_r \Rightarrow a_1 = ra_r \Rightarrow a_r + \omega d = ra_r \Rightarrow ra_r = \omega d$$

$$\Rightarrow a_r = \frac{\omega}{r} d$$

$$\Rightarrow a_1 + rd = \frac{\omega}{r} d \Rightarrow a_1 = \frac{1}{r} d \Rightarrow a_n = \frac{1}{r} d + (n-1)d = nd - \frac{1}{r} d$$

$$\Rightarrow \frac{a_1}{a_n} = \frac{rd - \frac{1}{r}d}{d - \frac{1}{r}d} = \frac{\frac{r^2 - 1}{r}}{\frac{r-1}{r}} = \frac{r^2 - 1}{r-1} = r \rightarrow \text{بـ } r$$

$$t_n = t_{n-r} + rd \Rightarrow rd = \omega \Rightarrow d = \omega$$

$$t_a^r - t_\omega^r = (t_q + t_\omega)(t_q - t_\omega) = (r \times t_v)(rd) \xrightarrow{d=\omega}$$

$$t_a^r - t_\omega^r = r \times r \times \omega \times t_v = r^2 t_v \Rightarrow t_v \text{ بـ } \frac{r^2}{r^2}$$

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

$$n \text{ لـ } 11 = r + nd = 11 \Rightarrow nd = 9$$

$$d = \frac{b-a}{m+1} = \frac{r_0}{r_{n-1}}$$

$$\Rightarrow \frac{r_0 n}{r_{n-1}} = 9 \Rightarrow$$

$$r_0 n = r_{n-1} \Rightarrow$$

$$r_n = 12 \Rightarrow$$

$$\boxed{n = 3}$$

$$a_n + a_{n+r} = a_r + a_{10} \Rightarrow a_{n+r} = a_{10} \Rightarrow n+r = 10 \Rightarrow$$

$$\boxed{n=1}$$

$$a_n = ra_r \Rightarrow d = \frac{ra_r - a_r}{r} = \frac{a_r}{r} \Rightarrow a_r = rd \Rightarrow$$

$$a_1 + rd = rd \Rightarrow a_1 = -d \Rightarrow a_n = -d + (n-1)d \Rightarrow$$

$$a_n = 0 \Rightarrow n-1 = 1 \Rightarrow \boxed{n=2} \Rightarrow \text{جـ لـ صـ فـ رـ سـ تـ}$$