

$$d = \frac{t_n - t_m}{n - m} = \frac{41 - 20}{11 - 1} = \frac{21}{10} = 2.1 \Rightarrow$$

$$t_n = 20 + (n-1) \times 2.1 \Rightarrow 20.1 = 20 + (n-1) \times 2.1 \Rightarrow 20.1 - 20 = (n-1) \times 2.1 \Rightarrow 0.1 = (n-1) \times 2.1 \Rightarrow$$

$$20.1 - 20 = (n-1) \times 2.1 \Rightarrow 0.1 = (n-1) \times 2.1 \Rightarrow 0.1 = 2.1n - 2.1 \Rightarrow 2.1n = 2.2 \Rightarrow n = \frac{2.2}{2.1} = 1.0476 \Rightarrow$$

حل: بیست و یکم ۲

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

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

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

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

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

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

$$a_1 + (n+1)d = -\frac{4}{3}n + 4 \Rightarrow a_1 + nd + d = -\frac{4}{3}n + 4 \Rightarrow d = -\frac{4}{3}$$

$$\Rightarrow a_1 - \frac{4}{3}n - \frac{4}{3} = -\frac{4}{3}n + 4 \Rightarrow a_1 = \frac{16}{3}$$

$$\left. \begin{array}{l} a_{14} = \frac{16}{3} + 14(-\frac{4}{3}) = -\frac{40}{3} \\ a_{18} = \frac{16}{3} + 18(-\frac{4}{3}) = -\frac{112}{3} \end{array} \right\} \Rightarrow a_{14} + a_{18} = -\frac{40}{3} - \frac{112}{3} = -\frac{152}{3}$$

$$\frac{a_1 + a_{18}}{2} = \frac{a_{14}}{2} \Rightarrow \frac{\frac{16}{3} + a_{18}}{2} = \frac{-\frac{40}{3}}{2} \Rightarrow \frac{16}{3} + a_{18} = -\frac{40}{3} \Rightarrow a_{18} = -\frac{56}{3}$$

$$\frac{r^n}{r} = \frac{r^n}{r} = r^{n-1} \Rightarrow r^n - 1 + r^n - 3 = 2(r^{n+1}) \Rightarrow$$

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

$$\frac{r^n}{r} = A, A^2 - 2 = 2A \Rightarrow A^2 - 2A - 2 = 0 \Rightarrow (A-2)(A+1) = 0 \Rightarrow$$

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

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

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

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

$\frac{\omega}{r}(a_1 + a_{10}) = \frac{1}{r} \times \frac{\omega}{r}(a_r + a_{10}) \Rightarrow a_r + a_{10} = r(a_1 + a_{10}) \Rightarrow$ $ra_1 = r \times a_{10} \Rightarrow a_1 = ra_{10} \Rightarrow a_{10} + \omega d = ra_{10} \Rightarrow ra_{10} = \omega d$ $\Rightarrow a_1 + rd = \frac{\omega}{r}d \Rightarrow a_1 = \frac{1}{r}d \Rightarrow a_n = \frac{1}{r}d + (n-1)d = nd - \frac{1}{r}d$ $\Rightarrow \frac{a_1}{a_n} = \frac{rd - \frac{1}{r}d}{d - \frac{1}{r}d} = \frac{r}{\frac{r}{r}} = r \Rightarrow \text{بـ } r$	٦
$t_n = t_{n-r} + rd \Rightarrow rd = 10 \Rightarrow d = 10 \Rightarrow$ $t_a^r - t_{\omega}^r = (t_q + t_{\omega})(t_q - t_{\omega}) = (r \times t_v)(rd) \xrightarrow{d=10}$ $t_a^r - t_{\omega}^r = r \times r \times 10 \times t_v = r^2 t_v \Rightarrow t_v \text{ بـ } \frac{r}{r^2}$	٧
$d = \frac{b-a}{n+1} = \frac{r + \sqrt{r} - (r - 12\sqrt{r})}{12} = \frac{13\sqrt{r}}{12} = \sqrt{r}$	٨
$\left. \begin{aligned} \text{في } n \text{ اعضاء} &= r + nd = 11 \Rightarrow nd = 9 \\ d = \frac{b-a}{m+1} &= \frac{r_0}{r_{n-1}} \end{aligned} \right\} \Rightarrow \frac{r_0 n}{r_{n-1}} = 9 \Rightarrow$ $r_0 n = r_{n-1} \times 9 \Rightarrow$ $r_0 n = 18 \Rightarrow$ $\boxed{n = 3}$	٩
$a_n + a_{n+r} = a_r + a_{10} \Rightarrow a_{n+r} = a_{10} \Rightarrow n+r = 10 \Rightarrow$ $a_n = ra_r \Rightarrow d = \frac{ra_r - a_r}{r} = \frac{a_r}{r} \Rightarrow a_r = rd \Rightarrow$ $a_1 + rd = rd \Rightarrow a_1 = -d \Rightarrow a_n = -d + (n-1)d \Rightarrow$ $a_n = 0 \Rightarrow n-1 = 1 \Rightarrow n = 2 \Rightarrow \text{جدول معكوس}$	١٠