

نام و نام خانوادگی پاسخنامه تشریحی تکلیف شماره ۱۳۰۰ کلاس
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$$a_1 + 3d = 41, a_1 = 15 \rightarrow 3d = 26 \Rightarrow d = 8$$

$$a_n = 15 + (n-1)8$$

$$15 \cdot n = 15 + 8n - 8 \Rightarrow 8n = 12 \Rightarrow n = \frac{12}{8} = \frac{3}{2}$$

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$$1 \leq V_n \leq 1000$$

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$$1 \leq V_n \leq 1000 \rightarrow \frac{1000-1}{1} + 1 = 1000$$

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$$n=0 \rightarrow a_1 + a_2 + a_3 = 12 \Rightarrow 3a_1 + 3d = 12 \Rightarrow a_1 + d = 4 \rightarrow a_2 = 4$$

$$n=3 \rightarrow a_1 + a_2 + a_3 = -4 \Rightarrow 3a_1 + 12d = -4 \Rightarrow a_1 + 4d = -\frac{4}{3} \rightarrow a_2 = -\frac{4}{3}$$

$$d = \frac{a_n - a_m}{n - m} = \frac{a_2 - a_1}{2 - 0} = \frac{-\frac{4}{3} - 4}{2} = -\frac{16}{3} \Rightarrow a_1 = 4$$

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$$\begin{cases} a_{14} = a_1 + 14d \rightarrow 4 + 14 \times \left(-\frac{16}{3}\right) = -\frac{224}{3} \\ a_n = a_1 + nd \rightarrow 4 + n \times \left(-\frac{16}{3}\right) = -\frac{224}{3} \end{cases} \rightarrow a_n + a_{14} = -\frac{448}{3}$$

$$\begin{cases} a_r = r^k - 1 \\ a_n = r^{k+1} \\ a_{13} = r^{13} - 3 \end{cases} \rightarrow \begin{cases} r^k = y \\ r^{k+1} = y \\ r^{13} = y^{13} - 3 \end{cases} \Rightarrow \begin{cases} a_r = y - 1 \\ a_n = y \\ a_{13} = y^{13} - 3 \end{cases}$$

$$a_n - a_r = a_{13} - a_n = ad$$

$$y - y + 1 = y^{13} - y - 3 \Rightarrow y^{13} - y - 4 = 0$$

$$(y-1)(y+1) = 0$$

$$a_r + a_n + a_{13} = y - 1 + y + y^{13} - 3 \xrightarrow{y=1} 1 - 1 + 1 + 1 - 3 = 0$$

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$$a_{14} - a_{10} = 4d = 20 \Rightarrow d = 5$$

$$a_1 + 4d + a_1 + 11d \rightarrow 2a_1 + 15d = 20 \Rightarrow a_1 = \frac{20 - 15 \times 5}{2} = -\frac{55}{2} \rightarrow a_n = -\frac{55}{2} + (n-1)5$$

$$a_{11} = -\frac{55}{2} + \frac{5 \times 10}{2} = \frac{5}{2}$$

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$$a_1 + ar + ar^2 + ar^3 + ar^4 = \frac{1}{r}(ar + ar^2 + ar^3 + ar^4) \Rightarrow a_1 + rd = \frac{1}{r}(ar + r^2d)$$

$$\Rightarrow r(a_1 + rd) = \frac{a}{r}(a_1 + rd) \Rightarrow a_1 + rd = \frac{a_1}{r} + \frac{r}{r}d \Rightarrow a_1 - \frac{a_1}{r} = r\frac{1}{r}d - rd \Rightarrow \frac{ra_1}{r} = \frac{d}{r}$$

$$\Rightarrow 4a_1 = rd \Rightarrow \underline{a_1 = \frac{1}{4}d}$$

$$\frac{ar}{a_1} = \frac{a_1 + d}{a_1} = \frac{\frac{1}{4}d + d}{\frac{1}{4}d} = \frac{\frac{5}{4}d}{\frac{1}{4}d} = \frac{5 \times r}{r \times 1} = \underline{5}$$

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$$t_n - t_{n-r} = 3d \Rightarrow rd = 12 \Rightarrow d = 4$$

$$\frac{t_1^r - t_0^r}{tr} \Rightarrow \frac{(t_1 + t_0)(t_1 - t_0)}{t_1 + d} \Rightarrow \frac{(t_1 + rd + t_1 - d)(rd)}{t_1 + d} \Rightarrow \frac{(r + 1 + r)(rd)}{t_1 + d}$$

$$\Rightarrow \frac{(r + 1 + 1)(r \cdot 1)}{t_1 + 4} = \frac{r \cdot (t_1 + 4)}{t_1 + 4} = \underline{r}$$

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$$d = \frac{t_m - t_n}{\frac{m}{r} - \frac{n}{r} + 1} \Rightarrow d = \frac{r + \sqrt{r} - r + 1r\sqrt{r}}{1r} = \frac{1r\sqrt{r}}{1r} = \underline{\sqrt{r}}$$

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$$\frac{r}{\text{جواب } r_n} \frac{r}{r} \rightarrow r_{n-1} \text{ نه}$$

$$a_{n-1} = rr$$

$$\rightarrow a_{n-1} = r + (r_{n-1} - r)d = rr, d = \frac{r}{r_{n-1} - r}$$

$$a_{n+1} = 11 \rightarrow a_{n-1} - a_{n+1} = r1$$

$$(r_{n-1} - r)d = r1$$

$$d \text{ جواب } (r_{n-1} - r) \left(\frac{r}{r_{n-1} - r} \right) = r1 \rightarrow \frac{r \cdot n - r}{r_{n-1} - r} = r1 \rightarrow \frac{r(n-1)}{r(n-1)} = r1$$

$$r_{n-1} - r1 = r_{n-1} - r \rightarrow r_{n-1} = 9$$

$$\rightarrow n = 9$$

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$$a_n + a_{n+r} = a_r + a_{1r} \rightarrow a_1 + (n-1)d + a_1 + (n+r)d = a_1 + rd + a_1 + 1rd$$

$$\Rightarrow \cancel{ra_1} + rnd + rd = \cancel{ra_1} + 1rd \Rightarrow \cancel{rd} + (n+1)d = \cancel{rd} \Rightarrow n+1 = 9 \Rightarrow \underline{n=8}$$

$$a_n = r a_{\frac{n}{r}} \Rightarrow a_1 + (n-1)d = r[a_1 + (\frac{n}{r} - 1)d] \Rightarrow a_1 + nd - d = ra_1 + \frac{rn}{r}d - rd$$

$$\Rightarrow a_1 + nd - d - ra_1 - \frac{rn}{r}d + rd = 0 \Rightarrow -ra_1 + \frac{-n+r}{r}d = 0 \rightarrow (-n+r)d = ra_1 \xrightarrow{n=9} -d = ra_1 \rightarrow a_1 = \underline{\frac{-d}{r}} \text{ ①}$$

$$a_k = 0 \rightarrow a_k = a_1 + (k-1)d \xrightarrow{\text{①}} -d + (k-1)d = rd(k-r) = 0 \begin{cases} d=0 \rightarrow \text{جواب } 0 \\ k-r=0 \rightarrow k=r \rightarrow a_r = \frac{-d}{r} \end{cases}$$