

۲۵

دنباله خفیه است یعنی فاصله ها ثابت  
۵, ۹, ۱۳, ۱۷  
+۴ +۴

الف)  $a_n = 5 + 4(n-1) \rightarrow a_n = 4n + 1$

ب)  $a_{10} = 5 + 4(9) \rightarrow a_{10} = 41$

۷, ۱۰, ۱۴, ۱۸  
+۳ +۳ +۳  
 $\rightarrow a_1 = 7$   
 $d = 3$

الف)  $S = \frac{n}{2}(2a + (n-1)d) \rightarrow S_{10} = 5(17 + (9 \times 3)) = 140$

ب)  $4 \times 18 = 72 \rightarrow t_{19}, t_{20}, t_{21}, t_{22} \rightarrow S = 4t_{19} + 7d \rightarrow 4(7 + 3 \times 18) + (4 \times 3) = 196$

$d = 2$  جمله دوم - جمله اول  $\Rightarrow 2 - 1 - \sqrt{3} = 1 - \sqrt{3}$

$t_{20} - t_{18} = 2d \Rightarrow \frac{2(1 - \sqrt{3})}{2} = 1 - \sqrt{3}$

در دنباله حسابی اختلاف ۲ جمله متوالی برابر است با ۳  
 $3 \times 5^{2n} - 5^{2n} = 5^y - 3 \times 5^{2n}$

$4 \times 5^{2n} - 5^{2n} = 5^y$

$5^{2n}(4-1) = 5^y \rightarrow 3 \times 5^{2n} = 5^y \xrightarrow{y=2n} 3 \times 5^{2n} = 5^{2n} \rightarrow 3 = 5^0$

$3 - 2n = y - 2$   
 $* 3 - 2n = y \xrightarrow{n=1} y = 3$

$\int \rightarrow xy = 3 \times 1 = 3$

$3 \times 1 = 3$   
 $x = 1$

$7x - 2x + 1 = 2x - 1 - 2x + 4$

$5x + 1 = 3$

$5x = 2$

$x = \frac{2}{5}$

$a_1 = 2(\frac{1}{5}) - 4 = -\frac{18}{5} \rightarrow a_n = -\frac{18}{5} + (n-1)5$

$\rightarrow 5n - \frac{18}{5}$

$d = 5(\frac{1}{5}) + 1 = 2$   
 $a_5 = 5(2) - \frac{18}{5} = \frac{42}{5}$



|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |    |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|
| $a_n = 3, \textcircled{\omega}, v, 9, \textcircled{11}, 13, 15, \textcircled{17}, \dots \rightarrow 2n+1=a_n \rightarrow a_{k_0} = k_0+1 = k_1$ $b_n = 2, \textcircled{\omega}, 11, \textcircled{11}, 14, \textcircled{17}, \dots \rightarrow a_n = 3n-1 \rightarrow a_{k_0} = 7_0-1 = \omega 9$ <p> <math>\rightarrow a_n = \omega + 7(n-1) = 7n-1 \rightarrow</math> <math display="block">\begin{aligned} 7n-1 &amp;\leq k_1 \\ 7n &amp;\leq k_2 \\ n &amp;\leq 7 \end{aligned}</math> </p> <p> <math>\leftarrow</math> میان <math>k_0</math> جمله نیست، <math>v</math> جمله مشترک وجود دارد <math>\leftarrow 5, 11, 17, 23, 29, 35, 41</math> </p> | 6  |
| $a_1 + a_r + a_p = 3a_1 + 3d = 21 \xrightarrow{3} a_1 + d = a_p = v$ $a_1 + a_p + a_\omega = 3a_1 + 4d = 10\omega \xrightarrow{3} a_1 + 2d = a_p = 3\omega$ $\rightarrow a_1 + a_r + a_p = 21 \xrightarrow{a_r=2v, a_p=3\omega} a_1 = -21$ $\rightsquigarrow a_p - a_r + a_1 = 3\omega - v - 21 = v \rightsquigarrow \frac{a_p - a_r + a_1}{a_1} = \frac{v}{-21} = \frac{-1}{3}$                                                                                                                                                                                                                                                                       | 7  |
| $\left. \begin{aligned} a_1 + a_r + a_p &= 1\omega \rightarrow 3a_1 + 3d = 1\omega \rightarrow a_1 + d = \omega \\ a_p + a_\omega &= 2\omega \rightarrow 3a_1 + 4d = 2\omega \end{aligned} \right\} \begin{aligned} 3a_1 + 3d &= 1\omega \\ -3a_1 + 4d &= 1\omega \\ \hline \omega d &= 1\omega \end{aligned} \xrightarrow{d=1\omega} \begin{aligned} 3a_1 + 3(1\omega) &= 1\omega \\ 3a_1 &= -2\omega \\ a_1 &= -\frac{2}{3}\omega \end{aligned}$ $\rightarrow a_n = 2 + 3(n-1) = 3n-1 \rightarrow a_{10} = 3(10)-1 = 29$                                                                                                                             | 8  |
| $S_9 = \frac{9}{2} (2a_1 + 8d) = 9(a_1 + 4d) = 9a_1 + 36d$ $S_9 = 9, S_p = 9 \left( \frac{p}{2} (2a_1 + (p-1)d) \right) = 9 \left( \frac{p}{2} (2a_1 + (p-1)d) \right) = pa_1 + \frac{p(p-1)}{2}d$ $\left. \begin{aligned} 2va_1 + 36d &= 9a_1 + 36d \\ 1na_1 &= 9d \\ d &= \frac{1}{3}a_1 \end{aligned} \right\}$ $\frac{a_{k_0}}{a_v} = \frac{a_1 + 19d}{a_1 + 4d} = \frac{a_1 + 19 \cdot \frac{1}{3}a_1}{a_1 + 1 \cdot \frac{1}{3}a_1} = \frac{1\frac{2}{3}a_1}{\frac{4}{3}a_1} = \frac{5}{2}$                                                                                                                                                      | 9  |
| $d = \frac{a_v - a_1}{v-1} = \frac{3\omega - 11}{7} = \frac{2}{7} = k \rightarrow a_n = 11 + k(n-1) = kn + v$ $a_k = b_k$ $k(k) + v = 3n + 3d'$ $2k = 3n + 3d' \rightarrow d' = -\omega$ $d' = \frac{a_{m+1} - a_m}{m+1} = -\omega$ $\frac{13 - 3n}{m+1} = -\omega$ $m+1 = \omega$                                                                                                                                                                                                                                                                                                                                                                     | 10 |

$\leftarrow$   $m=4$  واسطه حسابی بین 3 و 38، وجود دارد.