نام و نام خانوادگی: گروه دهم پنجشنبه دخترا — تکلیف شماره ۱۲

۱- الف) $t_n = 5 + (n-1)\times 4 = 4n+1$; $5, 9, 13, 17, \dots$ (+۴ +۴ +۴)

ب) $t_{10} = (4\times 10)+1 = 41$

۲- الف) $t_n = 4n+2$; $6, 10, 14, 18, \dots$ (+۴ +۴ +۴) ; $S_{10} = \frac{10}{2}(6+42) = 240$

$\hookrightarrow t_{10} = 40+2 = 42$; $S = \frac{n}{2}(a+l)$

ب) $t_{29}+t_{30}+t_{31}+t_{32} = t_{29}+t_{32}+t_{30}+t_{31} \longrightarrow 248\times 2 = 496$

$124+124 = 248$

۳- $1+\sqrt{3}, 2, 3-\sqrt{3}$; $d = 3-\sqrt{3}-1-\sqrt{3} = 2-2\sqrt{3} = 1-\sqrt{3}$

$t_{25} - t_{22} = 2d \longrightarrow 2(1-\sqrt{3}) = 2-2\sqrt{3}$

۴- $a^{2n} + a^5 = 4\times 4\times a^{2n} \Rightarrow a^{2n} + a^5 = 8a^{2n} \longrightarrow a^5 = 7a^{2n}$ $(\frac{a^5}{a^{2n}} = 1)$

$a^5 = a^{2n+1} \longrightarrow 5 = 2n+1 \longrightarrow n+5 = 2(2) = 4 \longrightarrow 2n+1+n = 4 \longrightarrow 3n+1 \longrightarrow n = 1$

$5 = 2n+1$

۵- $2n-4+6n = 2(2n-1) \Rightarrow 8n-4 = 4n-2 \longrightarrow 4n = 2 \longrightarrow n = \frac{1}{2}$

$-3, 0, 3, \dots \Rightarrow t_n = 3n-6 \longrightarrow t_4 = 12-6 = 6$ (+۳ +۳)

$\hookrightarrow t_n = a+(n-1)d \longrightarrow t_4 = -3+3(3) = 6$

۶- $5, 11, 17, \dots$ مسیر $\Rightarrow t_n = 6n-1 \longrightarrow a_{10} = (10\times 2)+1 = 21$

$6n-1 \le 41 \longrightarrow n \le 7$ ← تعداد جمله ۷ جمله

$\hookrightarrow a_n = 2n+1 = 41$; $b_n = 3n-1 = 59$

۷- $a_1+a_2+a_3=21 \Rightarrow a-d, a, a+d \Rightarrow a_1+a_2+a_3=3a_2=21$

$a_2=7 \rightarrow a+d=7$ $\quad a_1+a_2+a_5=3a_2=105 \Rightarrow a_2=35$

$a+2d=35$ $\quad \begin{cases} a+d=7 \\ a+2d=35 \end{cases} \Rightarrow d=28$ $\quad a_4-a_2+a_1=a_2$

$\frac{a+d}{a}=\frac{7}{-21}=-\frac{1}{3}$ $\quad a+2d=35 \Rightarrow a=-21$ $\quad \hookrightarrow a+d-a+a-d=a$

۸- $a_1+a_2+a_3=15 \rightarrow 3a+3d=15 \rightarrow a+d=5$

$a_4+a_5=25 \rightarrow 2a+7d=25$ $\quad \begin{cases} a+d=5 \\ 2a+7d=25 \end{cases} \Rightarrow a=2$

$a_{10}=a+9d \Rightarrow a_{10}=2+9(3)=29$ $\quad 5d=15 \Rightarrow d=3$

۹- $\frac{9}{2}(a+a+8d) = 9(\frac{3}{2}(a+a+2d)) \Rightarrow 9a+36d=27a+27d$

$9d=18a \rightarrow a=\frac{1}{2}d$ $\quad \frac{a_{20}}{a_7}=\frac{a+19d}{a+6d}=\frac{\frac{1}{2}d+19d}{\frac{1}{2}d+6d}=\frac{\frac{39}{2}d}{\frac{13}{2}d}=3$

۱۰- $\begin{cases} a_1=11 \\ a_7=a+6d=35 \end{cases} \Rightarrow 6d=24 \Rightarrow d=4$ $\quad a=11$ $\hookrightarrow a_4=a+3d=11+12=23$

$b_n=3n+8$, $\quad b_1=11$, $\quad b_4=23 \Rightarrow b_4=b_1+3d \Rightarrow 23=11+3d \Rightarrow d=4$

$d=\frac{b_n-b_1}{n+1}=4 \Rightarrow 20=4n+4 \Rightarrow 16=4n \Rightarrow n=4$ جمله‌ی چهارم