نام و نام خانوادگی ...[illegible]... پاسخنامه تشریحی تکلیف شماره ..۱.۳.. کلاس ...[illegible]...

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$a_1 = 40$, $a_4 = 61 \Rightarrow d = \frac{a_m - a_n}{m-n} = \frac{61-40}{4-1} = \frac{21}{3} = 7$

$7 + a = 40 \Rightarrow a = 33 \Rightarrow t_n = 7n + 33 \Rightarrow 7n + 33 = 208 \Rightarrow 7n = 175$

$\Rightarrow n = \underline{25}$

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$10 , 17 , 24$ ($+7$, $+7$) $\quad 7n + 3 \Rightarrow$ کم $= 7 \times 14 = 98 \rightarrow 98 + 3 = 101$

بیش $= 7 \times 142 = 994 \rightarrow 994 + 3 = 997$

$\Rightarrow$ تعداد $= \frac{997 - 101}{7} + 1 = \underline{129}$ (896)

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$a_3 = 2^x - 1 \,/\, a_8 = 2^{x+1} \,/\, a_{13} = 2^{2x} - 3 \Rightarrow a_8 = \frac{a_3 + a_{13}}{2} \Rightarrow \frac{(2^x - 1) + (2^{2x} - 3)}{2}$

$= 2^{x+1} \Rightarrow 2^{x+2} = 2^x + 2^{2x} - 4 \Rightarrow (4 \times 2^x) - 2^x - 2^{2x} + 4 = 0 \Rightarrow 3 \times 2^x - 2^{2x} + 4 = 0 \Rightarrow$

$2^x = y$ را شرط $\Rightarrow 3y - y^2 + 4 = 0 \Rightarrow y^2 - 3y - 4 = 0 \Rightarrow y = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} \Rightarrow y =$

$\frac{3 \pm \sqrt{25}}{2} = \frac{3 \pm 5}{2} \Rightarrow y = 4$ ✓, $y = -1$ ✗ ← چون 2^x منفی نمی‌تواند باشد $\Rightarrow 2^x = 4 \Rightarrow x = 2 \,/\, a_3 = 2^2 - 1 = 4 - 1 = 3 \,/\, a_8 = 2^{2+1} = 2^3$

$= 8 \,/\, a_{13} = 2^4 - 3 = 16 - 3 = 13 \Rightarrow 13 + 8 + 3 = \underline{24}$

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$a_{n+1} = a + nd \,/\, a_{n+2} = a + (n+1)d \,/\, a_{n+3} = a + (n+2)d \rightarrow (a+nd) + (a+(n+1)d) + (a+(n+2)d) = 3a + (3n+3)d =$

$3a + 3(n+1)d = -6n + 12 \Rightarrow a + (n+1)d = -2n + 4 \,/\, \text{if } n=1 \rightarrow a + 2d = -2(1) + 4 = 2 \,/\, \text{if } n = 2$

$\rightarrow a + 3d = -4 + 4 = 0 \,/ \Rightarrow \begin{cases} a + 2d = 2 \\ a + 3d = 0 \end{cases} \times(-1) \Rightarrow d = -2 \,/ \Rightarrow a + 2(-2) = 2 \Rightarrow a - 4 = 2 \Rightarrow a = 6$

$a_{17} = a + 16d = 6 + 16(-2) = 6 - 32 = -26$

$a_8 = a + 7d = 6 + 7(-2) = 6 - 14 = -8$ $\Big\} \Rightarrow a_{17} + a_8 = -26 + (-8) = \underline{-34}$

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$a_{12} - a_{10} = 5 = (a_1 + 11d) - (a_1 + 9d) = 2d \Rightarrow d = 2.5 \,/\, a_{12} + a_{10} = 25 = (a_1 + 11d) + (a_1 + 9d)$

$= 2a_1 + 20d = 25 \Rightarrow 2a_1 + (20 \times 2.5 = 50) = 25 \Rightarrow 2a_1 = -25 \Rightarrow a_1 = -12.5$

$a_{21} = a_1 + 20d = -12.5 + (20 \times 2.5 = 50) = \underline{37.5}$

$a_1=a$ / $a_2=a+d$ / $a_3=a+2d$ / $a_4=a+3d$ / $a_5=a+4d \rightarrow S_1=5a+10d$

$a_6=a+5d$ / $a_7=a+6d$ / $a_8=a+7d$ / $a_9=a+8d$ / $a_{10}=a+9d \rightarrow S_2=5a+35d$

$S_1=\frac{1}{3}S_2 \Rightarrow 5a+10d=\frac{1}{3}(5a+35d) \Rightarrow 3(5a+10d)=5a+35d \Rightarrow 15a+30d=$

$5a+35d \Rightarrow 10a=5d \Rightarrow a=\frac{d}{2} \Rightarrow \frac{a+d}{a}=\frac{a_2}{a}=\frac{\frac{d}{2}+d}{\frac{d}{2}}=\frac{\frac{3d}{2}}{\frac{d}{2}}=$ ۶

برابر ۳

$t_9=a+8d$ / $t_5=a+4d$ / $t_7=a+6d$ / $t_n=t_{n-3}+15 \Rightarrow t_n-t_{n-3}=15=$

$[a+(n-1)d]-[a+(n-4)d]=3d \Rightarrow 3d=15 \Rightarrow d=5$ / $t_9=a+40$ / $t_5=a+20$

$t_7=a+30$ / $\frac{t_9^2-t_5^2}{t_7}=\frac{(a+40)^2-(a+20)^2}{a+30} \Rightarrow \frac{[(a+40)-(a+20)]\times[(a+40)+(a+20)]}{a+30}=\frac{20(2a+60)}{a+30}=$ ۷

$\frac{40(a+30)}{a+30}=40$ برابر

$A=2(1-6\sqrt{3})=2-12\sqrt{3}$ / $B=1+\sqrt{3}$ / $\Rightarrow a_{14}=a+13d=B \Rightarrow A+13d=B$

$2-12\sqrt{3}+13d=2+\sqrt{3} \Rightarrow$ ← جزء ۱۴ام / ۱۴ امین جمله است A اولی

$13d=2-2+\sqrt{3}+12\sqrt{3}=13\sqrt{3} \Rightarrow d=\frac{13\sqrt{3}}{13}=\sqrt{3}$ ۸

$2, 32 \longrightarrow 3n-2$ رابطه $\longrightarrow$ رابطه n ام $=11 \Rightarrow 2, 5, 8, \ldots, 11, \ldots, 32$ ۱.۱

($+3$ $+3$ $+3$ $+3$ $+3$)

$5, 8, 11, 14, 17, 20, 23, 26, 29 \Rightarrow n=3 \Rightarrow (4\times3)-3=9$

$2+(4n-2)=4n-1 \rightarrow$ تعداد کل جملات / $a_k=a+(k-1)d \Rightarrow a_{4n-1}=a_1+(4n-2)d$ ۲.۱ ۹

$=32 \Rightarrow (4n-2)d=30 \Rightarrow d=\frac{30}{4n-2}$ / $a_{n+1}=a+nd=11 \Rightarrow 2+n\times\frac{30}{4n-2}=11 \Rightarrow$

(جمله n+1 ام جمله وسط است)

$n\times\frac{30}{4n-2}=9 \Rightarrow 36n-18=30n \Rightarrow 6n=18 \Rightarrow n=3$

$a_n+a_{n+4}=a_3+a_{17} \Rightarrow a+(n-1)d+a+(n+3)d=a_1+2d+a_1+16d \Rightarrow$

$2a_1+2nd-d+3d=2a_1+18d \Rightarrow 2(nd)=16d \Rightarrow nd=8d \Rightarrow n=8$

($-d+3d=2d$, $18d \to 16d$)

$a_8=2(a_4) \Longrightarrow a+7d=2(a+3d) \Rightarrow a+7d=3a+9d \Rightarrow 2a+2d=0$ ۱۰

$\Longrightarrow a+d=0 \Longrightarrow a+d=a_2 \Longrightarrow$ جمله دوم $=0$