نام و نام خانوادگی .... پاسخنامه تشریحی تکلیف شماره ۱۳ کلاس ..... دهم .....

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$$\begin{cases} a_1 = 40 \\ a_4 = 61 \rightsquigarrow \underset{40}{a_1} + 3d = 61 \rightsquigarrow 3d = 21 \Rightarrow d = 7 \end{cases}$$

$a_n = 40 + \underbrace{(n-1)7}_{7n-7} = \underline{7n + 33}$

$7n + 33 = 208$

$7n = 175$

$n = 25 \rightsquigarrow a_{25} = 208$

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$14(7) = 98 + 3 = 101 \rightsquigarrow$ اولین عدد با شرط داده شده

$999 \div 7 = 142$ ، باقیمانده ۵ ، $5 - 2 = 3 \rightsquigarrow 997 \div 7 = 142$ ، باقیمانده ۳

$\underbrace{101, 108}_{7}, \dots, 997$

تعداد جملات $= \left(\frac{997 - 101}{7}\right) + 1 = \underbrace{\left(\frac{896}{7}\right)}_{128} + 1 = \boxed{129} = n$

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$$\left.\begin{aligned} a_{n+1} &\Rightarrow a_n = a_1 + nd \\ a_{n+2} &\Rightarrow a_n = a_1 + (n+1)d \\ a_{n+3} &\Rightarrow a_n = a_1 + (n+2)d \end{aligned}\right\} \xrightarrow{\text{جمع}} 3a_1 + \underbrace{(3n+3)d}_{3nd + 3d} = \underbrace{-6n + 12}_{\text{مستقل}}$$

$* \quad 3dn = -6n$

$3d = -6$

$d = -2$

$\underset{d=-2}{\Longrightarrow} 3a_1 - 6n - 6 = -6n + 12$

$3a_1 = 18 \Rightarrow a_1 = 6 \rightsquigarrow a_n = 6 + \underbrace{(n-1)(-2)}_{-2n+2} = -2n + 8$

$$\left.\begin{aligned} a_{17} &= \underbrace{-2(17)}_{-34} + 8 = -26 \\ a_8 &= \underbrace{-2(8)}_{-16} + 8 = -8 \end{aligned}\right\} \quad a_{17} + a_8 = -26 - 8 = -34$$

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$a_3 = 2^x - 1$

$a_8 = 2^{x+1}$

$a_{13} = 2^{2x} - 3$

$d = \frac{2^{x+1} - 2^x - 1}{\cancel{(8-3)}} = \frac{2^{2x} - 3 - 2^{x+1}}{\cancel{(13-8)}} \rightsquigarrow 2^{x+1} - 2^x - 1 = 2^{2x} - 3 - 2^{x+1}$

$2^{x+1} - 2^x - 2^{2x} + 2^{x+1} = -4$

$2^x\underbrace{(2 - 2^x - 1 + 2)}_{3 - 2^x} = -4$

$3 \times 2^x - 2^{2x} = -4$

if $x = 2 \rightsquigarrow \underbrace{(3 \times 4)}_{12} - \underbrace{2^4}_{16} = -4$ ✓

$x = 2 \Rightarrow$

$$\left.\begin{aligned} a_3 &= 3 \\ a_8 &= 8 \\ a_{13} &= 13 \end{aligned}\right\} \quad a_3 + a_8 + a_{13} = 24$$

$* : d = \frac{a_m - a_n}{m - n}$

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$$\begin{cases} \overset{a_{10} + a_{12}}{\cancel{a_{10}} + 2d - \cancel{a_{10}}} = 5 \rightarrow 2d = 5 \rightarrow d = \frac{5}{2} \\ a_{10} + a_{12} = 25 \end{cases}$$

$2a_{10} + \underset{2(\frac{5}{2})}{2d} = 25 \rightsquigarrow 2a_{10} = \frac{25 - 5}{2} \rightarrow a_{10} = 10 \ , \ a_{12} = \underset{10}{a_{10}} + \underset{2(\frac{5}{2})}{2d} = 15$

$a_{21} = \underset{15}{a_{12}} + \underset{9(\frac{5}{2})}{9d} = 15 + \frac{45}{2} = \frac{75}{2} = 37.5$

$\frac{30}{2}$

$S_5 = \frac{5}{2}(\underbrace{a_1 + a_5}_{2a_1+4d}) = \frac{10a_1 + 20d}{2} = \frac{\cancel{10}^{5}(a_1+2d)}{\cancel{2}} = 5a_1 + 10d$

$S'_{10} = S_{10} - S_5 = \cancel{\frac{10}{2}}\underbrace{5(2a_1+9d)}_{10a_1+45d} - (5a_1+10d) = 5a_1 + 35d$

$5a_1 + 10d = \frac{1}{3}(5a_1+35d) \rightsquigarrow \frac{5a_1+10d}{\frac{1}{3}} = 5a_1 + 35d \rightsquigarrow 15a_1 + 30d = 5a_1 + 35d$ ۶

$\underset{2}{\cancel{10}}a_1 = 5d \rightsquigarrow 2a_1 = d \rightsquigarrow a_1 = \frac{d}{2}$ ☆

$\frac{a_2}{a_1} = \frac{a_1+d}{a_1} = \frac{\frac{d}{2}+\frac{2d}{2}}{\frac{d}{2}} = \frac{\frac{3\cancel{d}}{2}}{\frac{\cancel{d}}{2}} = 3$] درست

$\boxed{\to t_5 + 4d}$

$t_n = t_{n-3} + 15$

$\left.\begin{array}{l} t_n - t_{n-3} = 15 \\ t_n - \underbrace{t_{n-3}}_{t_n - 3d} = 3d \end{array}\right\} \begin{array}{l} 15 = 3d \\ d = 5 \end{array}$

$t_9^2 - t_5^2 \Rightarrow (\underbrace{t_9 - t_5}_{4d})(\underbrace{t_9 + t_5}_{2t_7}) = (\underbrace{4\overset{5}{d}}_{20})(2t_7) = 20(2t_7)$

$\frac{t_9^2 - t_5^2}{t_7} = \frac{20(2\cancel{t_7})}{\cancel{t_7}} = 40$ درست ۷

$\left.\begin{array}{l} a_1 = \underbrace{2(1-6\sqrt{3})}_{2-12\sqrt{3}} \\ a_x = 2+\sqrt{3} \end{array}\right\} \quad d = \frac{2+\sqrt{3}-2+12\sqrt{3}}{\underbrace{\cancel{(12+1)}}_{13}} = \frac{13\sqrt{3}}{13} = \sqrt{3}$

۱۲ واسطه ۸

☆ $d = \frac{b-a}{n+1}$

$a_1 = 2$

$a_x = 32 \rightsquigarrow \underbrace{a_{4n-1}}_{} = 32$

$4n-3$ واسطه

واسطه n ۲ و ۱۱ $\rightsquigarrow a_{n+1} = 11 \rightsquigarrow \underset{2}{a_1} + (n)d = 11 \rightsquigarrow nd = 9 \rightsquigarrow d = \frac{9}{n}$ ☆ ۹

تعداد جملات $= \underbrace{4n-3}_{\text{واسطه‌ها}} + \underbrace{2}_{\text{جمله اول و آخر}} = 4n-1$ $\Big\}$ $a_{4n-1} = 32 \Rightarrow \underset{2}{a_1} + (4n-2)d = 32 \rightsquigarrow (4n-2)\frac{9}{n} = 30$

$36n - 18 = 30n$

$6n = 18 \rightsquigarrow n = 3$

* a_{4n-1} , a_1 [illegible]
$4n-3$ واسطه است

$a_n + a_{n+4} = a_3 + a_{17}$

$t_m + t_n = t_p + t_q \rightsquigarrow 3+17 = 20 \rightsquigarrow n+n+4 = 20 \rightsquigarrow 2n = 16 \rightsquigarrow n = 8$ ☆

$a_n = 2a_{\frac{n}{2}} \overset{☆}{\rightsquigarrow} a_8 = 2a_4 \rightsquigarrow a_4 + 4d = 2a_4 \rightsquigarrow 4d = 2a_4 \rightsquigarrow \underbrace{a_4 = 2d}$ ۱۰

$a_1 + 3d = 2d \rightsquigarrow a_1 = -d$

$a_2 = a_1 + d = -d + d = 0 \rightsquigarrow a_2 = 0$

$-d, 0, d, \dots$

↳ $a_1 = -d$ فرض

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$S_5 = \frac{5}{2}(\underbrace{a_1+a_5}_{2a_1+4d}) = \frac{10a_1+20d}{2} = \frac{\overset{5}{\cancel{10}}(a_1+2d)}{\cancel{2}} = 5a_1+10d$

$S_{10} = S_{10}-S_5 = \frac{10}{2}(\underbrace{2a_1+9d}_{10a_1+45d}) - (5a_1+10d) = 5a_1+35d$

$5a_1+10d = \frac{1}{3}(5a_1+35d) \rightsquigarrow \frac{5a_1+10d}{\frac{1}{3}} = 5a_1+35d \rightsquigarrow 15a_1+30d = 5a_1+35d$

$10a_1 = 5d \rightsquigarrow 2a_1 = d \rightsquigarrow a_1=\frac{d}{2}$ ☆

$\frac{a_2}{a_1} = \frac{a_1+d}{a_1} = \frac{\frac{d}{2}+\frac{2d}{2}}{\frac{d}{2}} = \frac{\frac{3d}{2}}{\frac{d}{2}} = 3$

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$t_n = t_{n-3}+15$

$t_n - t_{n-3} = 15$

$t_n - \underbrace{t_{n-3}}_{t_n-3d} = 3d$

$15 = 3d$, $d=5$

$t_9^2 - t_5^2 \Rightarrow (\underbrace{t_9-t_5}_{4d})(\underbrace{t_9+t_5}_{2t_7}) = (\underbrace{4d}_{20})(2t_7) = 20(2t_7)$ ... t_5+4d

$\frac{t_9^2-t_5^2}{t_7} = \frac{20(2t_7)}{t_7} = 40$

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$a_1 = \underbrace{2(1-6\sqrt{3})}_{2-12\sqrt{3}}$

$a_x = 2+\sqrt{3}$

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

$k=12$

☆ $d = \frac{b-a}{n+1}$

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$a_1 = 2$

$a_x = 32 \rightsquigarrow \underbrace{a_{4n-1}}_{} = 32$

$4n-3$ واسطه

واسطه n تا $11 \rightsquigarrow a_{n+1} = 11$

تعداد کل جملات $= \underbrace{4n-3}_{\text{واسطه‌ها}} + \underbrace{2}_{\text{دو جمله اول و آخر}} = 4n-1$

☆ a_{4n-1} , a_1 بین آن‌ها $4n-3$ واسطه است

$d = \frac{a_m-a_n}{m-n} \rightsquigarrow d = \frac{a_{n+1}-a_1}{n+1-1} = \frac{11-2}{n} = \frac{9}{n}$

$d = \frac{a_{4n-1}-a_{n+1}}{4n-1-n-1} = \frac{32-11}{3n-2} = \frac{21}{3n-2}$

$d = \frac{9}{n}$ ☆

$\frac{9}{n} = \frac{21}{3n-2}$

$21n = 27n-18$

$18 = 6n \rightsquigarrow n=3$

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$a_n + a_{n+4} = a_3 + a_{17}$

$t_m+t_n = t_r+t_s \rightsquigarrow 3+17=20 \rightsquigarrow n+n+4=20 \rightsquigarrow 2n=16 \rightsquigarrow n=8$ ☆

$a_n = 2a_{\frac{n}{2}} \overset{☆}{\rightsquigarrow} a_8 = 2a_4 \rightsquigarrow a_4+4d = 2a_4 \rightsquigarrow 4d = 2a_4 \rightsquigarrow \underbrace{a_4 = 2d}$

$a_1+3d = 2d \rightsquigarrow a_1 = -d$

$a_2 = a_1+d = -d+d = 0 \rightsquigarrow a_2 = 0$

$-d, 0, d, \dots$

$a_1 = -d$ منفی