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کیمیا صفاهانی _ دهم دختر _ تکلیف شماره ۱۵

① $a+aq+aq^2=21$

$(a)(aq)(aq^2)=64 \rightarrow a^3q^3=64 \rightarrow (aq)^3=64 \rightarrow aq=4 \,,\, a=\frac{4}{q}$

$\frac{4}{q}(1+q+q^2)=21 \rightarrow 4+4q+4q^2=21q \rightarrow 4q^2-17q+4=0 \rightarrow q^2-17q+16=0$

$\rightarrow (q-16)(q-1)=0 \rightarrow q=\frac{16}{4}=4$ غ ق ق

$q=\frac{1}{4}$ ق ق

② $(2x)^2=(x^2-2)(x^2+4) \rightarrow 4x^2=x^4+4x^2-2x^2-8 \rightarrow x^4-2x^2-8=0$

$\rightarrow (x^2-4)(x^2+2)=0 \rightarrow x=2 \rightarrow 8,4,2$ $(\times\frac{1}{2},\ \times\frac{1}{2})$

$x=\sqrt{-2}$ غ ق ق

$S_7=\frac{8\left((\frac{1}{2})^7-1\right)}{\frac{1}{2}-1} \rightarrow 8\left(\frac{\frac{-127}{128}}{-\frac{1}{2}}\right)=\frac{127\times2\times\cancel{8}}{\cancel{8}\times128}=\boxed{\frac{127}{8}}$

③ $(1+q+q^2+q^3+q^4)=\frac{121}{81}$

$\times a \rightarrow a+aq+aq^2+aq^3+aq^4 \rightarrow 243\times\frac{121}{81}=363$

④ $1,\_,\_,A,\_,\_,64 \rightarrow \frac{63}{6}=10.5 \rightarrow A=1+(10.5\times3)=32.5$

$1,\_,\_,B,\_,\_,64 \rightarrow q^6=64 \rightarrow q=\pm2 \rightarrow B=\pm8$

$A+B \rightarrow 32.5+8=40.5$

$A+B \rightarrow 32.5-8=24.5$

⑤ $-24,-\frac{95}{4},\ldots \rightarrow -\frac{95}{4}+24 \rightarrow \frac{-95+96}{4}=\frac{1}{4} \rightarrow a_{101}=-24+(\overset{25}{\cancel{100}\times\frac{1}{\cancel{4}}})=\boxed{1}$

$128,a_2,\ldots,\boxed{a_8=1} \rightarrow \frac{aq^7}{a}=\frac{1}{128} \rightarrow q^7=\frac{1}{128} \rightarrow q=\boxed{\frac{1}{2}}$

⑥ $\underbrace{a+2d}_{a_3},\ \underbrace{a+6d}_{a_7},\ \underbrace{a+8d}_{a_9} \rightarrow (a+6d)^2=(a+2d)(a+8d)$

$\rightarrow \cancel{a^2}+36d^2+12ad=\cancel{a^2}+\overbrace{8ad+2ad}^{10ad}+16d^2 \rightarrow 20d^2+2ad=0 \rightarrow 2d(10d+a)=0$

$d=0 \rightarrow d=\boxed{\frac{-a}{10}}$

⑦ $\underbrace{a+2d}_{a_3},\ \underbrace{a+3d}_{a_4},\ \underbrace{a+7d}_{a_8} \rightarrow (a+3d)^2=(a+2d)(a+7d) \rightarrow 2d(d-a) \rightarrow$ ① $d=0$ ② $d=a$

چون متمایز هستند غیر قابل قبول!

$a_1=\frac{1}{4} \rightarrow a_{10}=aq^9=\frac{1}{4}\times q^9$

Arman

q نیاز $\rightarrow \overset{2a}{a+d}=\frac{1}{4} \rightarrow a=\frac{1}{8} \rightarrow q=\frac{(\frac{1}{8}+\frac{3}{8})}{(\frac{1}{8}+\frac{1}{8})}=2 \rightarrow aq^9=\frac{1}{4}\times2^9 \rightarrow 2^7=128$

2^{-2}

(8) غیرثابت

$3a_2 \,,\, 2a_3 \,,\, a_4 \rightarrow 3(aq) \,,\, 2(aq^2) \,,\, aq^3$ $\qquad \frac{1}{(q-1)}\frac{3}{(q-3)}$

$4aq^2 = 3aq + aq^3 \rightsquigarrow \cancel{a}(4q^2) = \cancel{a}(3q+q^3) \rightarrow q^3 - 4q^2 + 3q = 0 \rightarrow q(q^2-4q+3)=0$

$\rightarrow q = 0 \rightarrow$ غ‌ق‌ق

$q = 1 \rightarrow$ غ‌ق‌ق (ثابت)

$\boxed{q = 3} \rightarrow$ ق‌ق

(9) $d = a_2 - a_1 \rightarrow \frac{7}{4} - 2 = -\frac{1}{4}$

$a_n = 2 + (n-1)\cancel{d}^{\,-\frac{1}{4}} \rightarrow a_n = \frac{-n}{4} + \frac{9}{4} \rightsquigarrow a_4 = \frac{5}{4} \,,\; a_8 = \frac{1}{4} \,,\; a_{13} = -1$

$\frac{5}{4} + x \,,\, \frac{1}{4} + x \,,\, -1 + x$

$\rightsquigarrow (\frac{1}{4} + x)^2 = (\frac{5}{4} + x)(x-1) \rightarrow \frac{x}{4} = -\frac{21}{16} \rightarrow x = \frac{4\times -21}{16} = -5/25$

$-4 \,,\, -5 \,,\, -6/25 \rightsquigarrow q = \frac{-5}{-4} = \frac{5}{4}$

(10) $a + aq^3 + aq^6 = 73 \rightarrow a(1+q^3+q^6) = 73$

$\underbrace{t_1}_{t_1} + \underbrace{t_1 + d}_{t_2} + \underbrace{t_1 + 9d}_{t_{10}} \rightarrow 3t_1 + 10d = 73$ $\begin{cases} d = aq^3 - a \rightsquigarrow a(q^3-1) \\ 9d = aq^6 - a \rightsquigarrow a(q^6-1) \end{cases} \rightarrow \begin{cases} 9q^3 - 9 = q^6 - 1 \\ \boxed{q^6 - 9q^3 + 8 = 0} \end{cases}$ *

$q = \pm 1$

* $(q^3-8)(q^3-1) = 0$

$q = \pm\sqrt{8}$

$d \rightsquigarrow a(\cancel{8}^{\,7}-1) \rightarrow d = 7a \rightarrow \boxed{d = 7}$ یا $\boxed{d = 0}$ چه خواهد داشت دنباله حسابی ثابت $q = 1$ اگر؟