نام و نام خانوادگی امیرعباس عادل‌جو .... پاسخنامه تشریحی تکلیف شماره 15 کلاس B - دهم

$a_1+a_2+a_3=21$

$a_1+a_1q+a_1q^2=21$

$a_1\times a_1q\times a_1q^2=64 \Rightarrow a_1^3\times q^3=64 \Rightarrow a_1q=a_2=4 \to a_1=\frac{4}{q} \Rightarrow$ 1

$a_1+a_1q+a_1q^2=21 \Rightarrow \frac{4}{q}+4+4q=21 \xRightarrow{\times q} 4+4q+4q^2=21q \Rightarrow 4q^2-17q+16=0 \Rightarrow$

$q^2-17q+16=0 \Rightarrow (q-16)(q-1)=0 \Rightarrow q=\frac{1}{4}$ یا $\frac{16}{4}=4 \Rightarrow \boxed{q=\frac{1}{4}} \to$ قابل قبول است چون حسابی نیست

$\frac{a_3}{a_2}=\frac{a_2}{a_1} \Rightarrow a_1\times a_3=(a_2)^2 \Rightarrow 4x^2=(x^2+4)(x^2-2) \Rightarrow 4x^2=x^4+2x^2-8 \Rightarrow$

$x^4-2x^2-8=0 \Rightarrow (x^2-4)(x^2+2)=0 \Rightarrow x^2=-2 \to$ غ ق ق (غیرقابل) یا $x^2=4$ ق ق $\Rightarrow$

$x=\pm 2$ → if $x=2 \Rightarrow$ جملات: ۸ و ۴ و ۲ و ... $\Rightarrow q=\frac{1}{2} \to q>0 \Rightarrow$ ق ق 2

→ if $x=-2 \Rightarrow$ جملات: ۸ و ۴- و ۲ و ... $\Rightarrow q=-\frac{1}{2} \to q<0 \Rightarrow$ غ ق ق

$S_7=a_1\left(\frac{1-q^7}{1-q}\right)=8\times\left(\frac{1-(\frac{1}{2})^7}{1-\frac{1}{2}}\right)=8\left(\frac{1-\frac{1}{128}}{\frac{1}{2}}\right)=8\times 2\times\frac{127}{128}=\boxed{\frac{127}{8}}=\boxed{15.875}$

روش ۱: $S_5=a_1+a_2+a_3+a_4+a_5=a_1+a_1q+a_1q^2+a_1q^3+a_1q^4 \Rightarrow S_5=$

$a_1(1+q+q^2+q^3+q^4) \Rightarrow a_1=243$ و $1+q+q^2+q^3+q^4=\frac{121}{81} \Rightarrow$ 3

$S_5=\cancel{243}^{\,3}\times\frac{121}{\cancel{81}_{\,1}}=3\times 121=\boxed{363}$

روش ۲: یا $S_5=a\left(\frac{1-q^5}{1-q}\right) \Rightarrow 1-q^5 \div 1-q=(q^4+q^3+q^2+q+1) \Rightarrow \frac{1-q^5}{1-q}=\frac{121}{81} \Rightarrow$

$S_5=243\times\frac{121}{81}=\boxed{363}$

۱ و — و — و A و — و — و ۶۴ / ۱ و — و — و B و — و — و ۶۴

$A=a_4=\frac{a_1+3d}{2} \Rightarrow a_1+6d=2a_4 \Rightarrow 64+1=2a_4 \Rightarrow \boxed{a_4=\frac{65}{2}}$

$B=a_4 \Rightarrow (a_4)^2=a_1\times a_7=64 \Rightarrow a_4=\pm 8$ → $B+A=\frac{65}{2}+8=\frac{81}{2}=\boxed{40.5}$; → $A+\underset{-8}{B}=\frac{65}{2}-8=\frac{49}{2}=\boxed{24.5}$

$d=-\frac{95}{4}-(-24)=\frac{-95}{4}+\frac{96}{4}=\frac{1}{4} \Rightarrow a_{101}=a_1+100d=a_1+\frac{100}{4}$

$a_2=-\frac{95}{4}$, $a_1=-24$ $\Rightarrow a_{101}=\frac{-96}{4}+\frac{100}{4}=\frac{4}{4}=1$ 5

$a_1=128$

$a_8=128\times q^7 \Rightarrow a_8=10\ 128\times q^7 \Rightarrow \boxed{q=2}$

$a_3, a_7, a_9 = a+2d, a+6d, a+8d \Rightarrow (a+6d)^2 = (a+2d)(a+8d) \Rightarrow$

$a^2+12ad+36d^2 = a^2+10ad+16d^2 \Rightarrow 2ad+20d^2=0 \Rightarrow 2d(a+10d)=0$

$\Rightarrow \boxed{d=0}$ یا $d=\frac{-a}{10}=\boxed{-\frac{1}{10}a}$ 6

$\frac{a+3d}{a+d}=\frac{a+7d}{a+3d} \Rightarrow (a+3d)^2=(a+d)(a+7d) \Rightarrow$

$a^2+6ad+9d^2=a^2+8ad+7d^2 \Rightarrow -2ad+2d^2=0 \Rightarrow a=d$

$-2d(a-d)=0$

$a_2=b_1=\frac{1}{4} \Rightarrow a+d=\frac{1}{4} \Rightarrow 2a=\frac{1}{4} \Rightarrow a=\frac{1}{8}=d \Rightarrow$ 7

$q=\frac{a_4}{a_2}=\frac{a+3d}{a+d}=\frac{\frac{1}{2}}{\frac{1}{4}}=2 \Rightarrow a_{10}=\frac{1}{4}\times q^9=\frac{2^9}{4}=\boxed{128}$

$3a_2, 2a_3, a_4 \longrightarrow 2(2a_3)=3a_2+a_4 \Rightarrow 4\times \cancel{a_1}q^2=3\cancel{a_1}q+\cancel{a_1}q^3 \Rightarrow$

$4q^2=3q+q^3 \Rightarrow q^3-4q^2+3q=0 \Rightarrow q(q^2-4q+3)=0 \Rightarrow q(q-1)(q-3)=0$

$\Rightarrow q=0$ یا 3 یا $1 \longrightarrow q=3 \rightarrow$ فقط قابل قبول است چون باید غیر ثابت باشد 8

$\frac{8}{4}, \frac{7}{4}, \frac{6}{4}, \ldots \Rightarrow a_4=2+3\times(-\frac{1}{4})=\frac{5}{4}, \quad a_8=2+7\times(-\frac{1}{4})=\frac{1}{4}$

$d=-\frac{1}{4} \quad -\frac{1}{4} \qquad a_{13}=2+12\times(-\frac{1}{4})=\frac{-4}{4}=-1$

$b_1=a_{13}+k, \ b_2=a_8+k, \ b_3=a_4+k \Rightarrow (b_2)^2=b_3\times b_1 \Rightarrow$ 9

$(\frac{1}{4}+k)^2=(\frac{5}{4}+k)(-1+k) \Rightarrow \frac{1}{16}+\frac{1}{2}k+k^2=\frac{5}{4}k-\frac{5}{4}+k^2-k \Rightarrow$

$16(\frac{1}{16}+\frac{1}{2}k=\frac{1}{4}k-\frac{5}{4}) \Rightarrow 1+8k-4k=-20 \Rightarrow k=\frac{-21}{4} \Rightarrow q=\frac{b_2}{b_1}=\frac{\frac{1}{4}+(-\frac{21}{4})}{\frac{5}{4}+(-\frac{21}{4})}=\frac{5}{4} \Rightarrow$

$\boxed{q=\frac{5}{4}}$

$a_1, a_4, a_{10} = a, aq^3, aq^6 \Rightarrow$

$a_4-a_1=\frac{a_{10}-a_4}{8} \Rightarrow aq^3-a=\frac{aq^6-aq^3}{8}=\frac{\cancel{a}q^3(\cancel{a}q^3-1)}{8} \Rightarrow$ 10

$\cancel{a}(q^3-1)$

$q^6-9q^3+8=0 \Rightarrow (q^3-1)(q^3-8)=0 \Rightarrow q=1$ یا $q=2 \rightarrow$ غیر ثابت $\Rightarrow$

$a+a(2)^3+a(2)^6=73 \Rightarrow a(1+8+64)=73 \Rightarrow a=\frac{73}{73}=1 \Rightarrow \boxed{d=a_2-a_1=8-1=7}$