کوثر عبدالی

$a_1 \times a_2 \times a_3 = 64 \Rightarrow \frac{a_2}{q} \times a_2 \times a_2 q = 64 \Rightarrow a_2^3 = 64 \Rightarrow a_2 = 4$ ①

$\frac{4}{q} + 4 + 4q = 21 \Rightarrow 4 + 4q^2 = 17q \Rightarrow 4q^2 - 17q + 4 = 0$

$\Delta = (-17)^2 - 4(4)(4) = 225 \Rightarrow q = \frac{+17 \pm 15}{8}$ → 4 , $\frac{1}{4}$

$a_1 = x^2 + 4 \quad a_2 = 2x \quad a_3 = x^2 - 2$ ②

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

$\Rightarrow x^4 - 2x^2 - 8 = 0$ $\quad$ $x^2 = y$

$y^2 - 2y - 8 = 0 \rightarrow y = \frac{+2 \pm \sqrt{36}}{2} =$ → 4 , -2

$q > 0 \Rightarrow 4 \rightarrow x^2 = 4 \Rightarrow x = \pm 2$

$\rightarrow x = 2 \Rightarrow 8, 4, 2$ ✓ $\quad$ ✓نزولی $\quad$ $q > 0$

$\times \frac{1}{2} \quad \times \frac{1}{2}$

$\rightarrow S_7 = a_1 \frac{1-(\frac{1}{2})^7}{1-(\frac{1}{2})} = 8 \times \frac{\frac{127}{128}}{\frac{1}{2}} = \frac{8 \times 127}{64}$

$= \boxed{\frac{127}{8}}$

$S_5 = \frac{1(1-q^5)}{1-q} = 1 + q + q^2 + q^3 + q^4 = \frac{121}{81} = \frac{11^2}{9^2}$ ③

$\cancel{1+q+q^2+q^3+q^4 - \frac{121}{81} = 0 \Rightarrow 81 + 81q + 81q^2 + 81q^3 + 81q^4 - 121 = 0}$

$\cancel{\Rightarrow 81q^4 + 81q^3 + 81q^2 + 81q = 40}$

$\frac{1-q^5}{1-q} = \frac{121}{81} \rightarrow 1 - q^5 = \frac{121}{81}(1-q) \Rightarrow 1 - q^5 = \frac{121}{81} - \frac{121}{81}q$

$\Rightarrow q^5 - \frac{121}{81}q + \frac{121}{81} - 1 = 0 \Rightarrow q^5 - \frac{121}{81}q + \frac{40}{81} = 0 \rightarrow \frac{1}{3}$

$81 = 3^4 , \quad 121 = 11^2$ $\quad$ $\frac{1}{3}, \frac{2}{3}, \frac{4}{3}, \frac{4}{9}$

$\Rightarrow 81(\frac{1}{3})^5 - 121(\frac{1}{3}) + 40$

$\Rightarrow 81(\frac{1}{243}) - \frac{121}{3} + 40 \Rightarrow \frac{1-121}{3} + 40$

$1 + \frac{1}{3} + \frac{1}{9} + \frac{1}{27} + \frac{1}{81} = \frac{121}{81}$

PAPCO $\Rightarrow \frac{-120}{3} + 40 \Rightarrow -40 + 40 = 0$ ✓

$\Rightarrow \boxed{\frac{1}{3}}$

$\Rightarrow \cancel{q^5 = 243(1-\frac{1}{243})}$

ادامه صفحه بعد

گروه کلاسی

$n=۵ , q=\frac{1}{۳} , a=۲۴۳$

$\Rightarrow S_5 = \frac{۲۴۳(1-\frac{1}{۲۴۳})}{\;\;-1} \Rightarrow \frac{۲۴۳(\frac{۲۴۳-1}{۲۴۳})}{\frac{۳-1}{۳}} \Rightarrow \frac{۲۴۳(\frac{۲۴۲}{۲۴۳})}{\frac{۲}{۳}}$

$\Rightarrow S_5 = \frac{۲۴۲}{\frac{۲}{۳}} \Rightarrow ۲۴۲ \times \frac{۳}{۲} \Rightarrow \frac{۲۴۲\times ۳}{۲} \Rightarrow ۱۲۱\times ۳$

$S_5 = ۳۶۳$

۴

$a_1 , a_2 , a_3 , \overset{A}{a_4} , a_5 , a_6 , a_7$

$a_n = a_1+(n-1)d \quad , \quad a_1=1 \;,\; a_7=۶۴ \;,\; n=۷$

$\Rightarrow ۶۴=1+۶d \Rightarrow \boxed{d=۱۰/۵}$

$\Rightarrow a_4 = a_1+(n-1)d \Rightarrow a_4 = 1+۳\times ۱۰/۵ = \boxed{۳۲/۵}$

$a_n = a_1 . r^{n-1} \quad a_1=1 \quad a_7=۶۴$

$\hookrightarrow ۶۴ = 1\times r^6 \Rightarrow \boxed{r=\pm ۲}$

$\xrightarrow{r+} a_1=1 , r=۲ \Rightarrow B=a_4=۲^۳=\boxed{۸}$

$r=-۲ \Rightarrow B=a_4=-۲^۳=\boxed{-۸}$

$\Rightarrow A=۳۲/۵ \;,\; B=\pm۸.$

$۳۲/۵+۸=۴۰/۵$

$۳۲/۵-۸=۲۴/۵$

۵

$a_1=-۲۴ \;(\frac{۹۶}{۴}) , a_2=\frac{۹۵}{۴} \quad d=a_2-a_1 \Rightarrow \frac{۹۵}{۴}-(-۲۴)$

$d = -\frac{۹۵}{۴}+\frac{۹۶}{۴} = \boxed{\frac{1}{۴}}$

$a_{۱۰۱} = -۲۴+۲۵ = \boxed{1}$

حل $a_1=۱۲۸ , a_8=1$

$a_8 = a_1\times r^7 \Rightarrow r^7 = \frac{1}{۱۲۸} = \boxed{\frac{1}{۲}}$

کوثر علی‌مددی

(۳)

$a_3 = \cancel{a_1 + (3-1)d} = a_1 + 2d$

$a_7 = \cancel{a_1 + (7-1)d} = a_1 + 6d$

$a_9 = \cancel{a_1 + (9-1)d} = a_1 + 8d$

$(a_7)^2 = (a_3)(a_9) \Rightarrow (a_1+6d)^2 = (a_1+2d)(a_1+8d)$

$\Rightarrow a_1^2 + 12a_1d + 36d^2 = a_1^2 + 8a_1d + 2a_1d + 16d^2$

$\Rightarrow a_1^2 + 12a_1d + 36d^2 = a_1^2 + 10a_1d + 16d^2$

$\Rightarrow 12a_1d + 36d^2 = 10a_1d + 16d^2$

$\Rightarrow 12a_1d - 10a_1d + 36d^2 - 16d^2 = 0 \Rightarrow 2a_1d + 20d^2 = 0$

$\Rightarrow \boxed{2d(a_1 + 10d) = 0}$ $\Rightarrow 2d = 0 \Rightarrow d = 0$ (۱)

$a_3 = a_7 = a_9 = a_1 \Leftarrow$ تمام جملات با هم برابرند

$r = \frac{a_1}{a_1} = 1 \Leftarrow$ دنباله‌ی ثابت $a_1 \neq 0$ اما اگر $a_1 = 0$ باشد همه‌ی جملات صفر می‌شوند ... r نامعلوم است $\Leftarrow$ a_1 ها تشکیل دنباله‌ی هندسی می‌دهند

$d = -\frac{a_1}{10} \Leftarrow 10d = -a_1 \Leftarrow a_1 + 10d = 0$ (۲)

$r = \frac{a_7}{a_3}, d = -\frac{a_1}{10} \Rightarrow r = \frac{a_1 + 6(-\frac{a_1}{10})}{6a_1} = \frac{4a_1}{8a_1}$

$a_1 \neq 0$

$\Rightarrow r = \frac{4}{8} = \frac{1}{2}$

$r = 1$ بود $d = 0, a_1 \neq 0$

$\hookrightarrow a_1 \neq 0, d = -\frac{a_1}{10} \Rightarrow r = \frac{1}{2}$

اگر $a_1 = 0$ باشد آنگاه همه صفرند

[illegible]

$$a_2 = a_1 + d \;,\; a_4 = a_1 + 3d \;,\; a_8 = a_1 + 7d$$

$$(a_4)^2 = (a_2)(a_8) \qquad d \neq 0$$

$$(a_1 + 3d)^2 = (a_1 + d)(a_1 + 7d)$$

$$\Rightarrow a_1^2 + 2(a_1)(3d) + 9d^2 = a_1^2 + (a_1)(7d) + (d)(a_1) + (d)(7d)$$

$$\Rightarrow \cancel{9d^2} \quad 2d^2 - 2a_1 d = 0 \Rightarrow 2d(d - a_1) = 0$$

$$2d = 0 \Rightarrow d = 0$$

$$d - a_1 = 0 \Rightarrow d = a_1$$

$$\Rightarrow d = 0 \Rightarrow a_2 = a_4 = a_8 = a_1 \quad \times$$ ثابت

$$\Rightarrow \boxed{d = a_1}$$

$$q = \frac{a_4}{a_2} \;,\; q = \frac{a_8}{a_4}$$

$$a_2 = a_1 + d = a_1 + a_1 = 2a_1$$

$$a_4 = a_1 + 3d = a_1 + 3a_1 = 4a_1$$

$$a_8 = a_1 + 7d = a_1 + 7a_1 = 8a_1$$

$$\Rightarrow q = \frac{4a_1}{2a_1} \xrightarrow{a_1 \neq 0} \boxed{q = 2}$$ و چون $a_1 = 0$، $d = 0$ ~~نیست~~

$$b_1 = \frac{1}{4} \;,\; q = 2$$

$$\Rightarrow b_n = b_1 \cdot q^{n-1}$$

512

$$n = 10 \; (b_{10}) \rightarrow b_{10} = \frac{1}{4} \times 2^9 \Rightarrow \boxed{b_{10} = 128}$$

PAPCO

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کل سؤال غلط (۳)

$t_1=a,\ t_2=aq,\ t_3=ar^2,\ t_4=ar^3$

~~$3t_2=3ar,\ 2t_3=2ar^2,\ t_4=ar^3$~~

$3t_2,\ 2t_3,\ t_4=(3ar,\ 2ar^2,\ ar^3)$

$2(2ar^2)=3ar+ar^3 \Rightarrow 4r=3+r^2$

$\Rightarrow r^2-4r+3=0 \quad (r-1)(r-3)=0 \to r=1,\ r=3$

$r=1 \longrightarrow$ غ ق ق

$r=3$ ✓

۹

$d=\dfrac{\frac{7}{4}-2}{2-1}=\dfrac{-1}{4} \quad a_1=2$

$a_4=a_1+3d=2+\dfrac{-3}{4}=\dfrac{5}{4}$

$a_8=a_1+7d=2+\dfrac{-7}{4}=\dfrac{1}{4}$

$a_{13}=a_1+12d=2+(-3)=-1$

$b_1=\dfrac{5}{4}+k,\ b_2=\dfrac{1}{4}+k,\ b_3=-1+k$

$\Rightarrow \left(\dfrac{1}{4}+k\right)^2=\left(\dfrac{1}{4}\right)^2+2\left(\dfrac{1}{4}\right)k+k^2 \Rightarrow$

$\dfrac{1}{16}+\dfrac{1}{2}k+k^2=-\dfrac{5}{4}+\dfrac{1}{4}k+k^2$

$\Rightarrow \dfrac{2}{4}k-\dfrac{1}{4}k=\dfrac{-20}{16}-\dfrac{1}{16} \Rightarrow \dfrac{1}{4}k=-\dfrac{21}{16}$

$\Rightarrow k=\dfrac{-21}{4}$

$b_1=-4,\ b_2=-5,\ b_3=\dfrac{-25}{4}$

$q=\dfrac{-5}{-4}=\dfrac{5}{4}$ و $\dfrac{\frac{-25}{4}}{-5}=\dfrac{5}{4}$

a_1 , a_4 , a_7

a , aq^3 , aq^6 $\qquad a^2q^6 = a^2q^6$ $\qquad d=q^3$

$a(1+q^3+q^6)=73$ $\qquad 2aq^3 = a(1+q^6)$

$\frac{1+q^6}{2}$ $\qquad q^3 = \frac{1+q^6}{2}$

$a(1+q$

$\frac{aq^3(1-q^3)}{8} = q^3$

$aq^3(1-q^3) = 8q^3$

$a_1 , a_4 , a_7 \to a , aq^3 , aq^6$

کنکور عاملی (۱۵)

$\qquad\qquad\qquad\qquad A \quad A+d \quad A+9d$

$\boxed{A=a}$

$a + aq^3 + aq^6 = 72$

معادله $\to$ $\boxed{\begin{array}{l} aq^3 = a+d \\ d = aq^3 - a \end{array}}$ $\qquad \boxed{\begin{array}{l} aq^6 = a+9d \\ 9d = aq^6 - a \\ \Rightarrow d = \frac{aq^6-a}{9} \end{array}}$

$aq^3 - a = \frac{aq^6-a}{9} \Rightarrow 9aq^3 - 9a = aq^6 - a$

$\Rightarrow a(q^6 - 9q^3 + 8) = 0$

$q^3 = x \to x^2 - 9x + 8 = 0$

$\Rightarrow (x-1)(x-8) = 0 \quad \begin{cases} x=8 \\ x=1 \end{cases}$

$\Rightarrow q^3 = 1 \Rightarrow \overset{\text{غیرممکن}}{q=1} , \; q^3 = 8 \Rightarrow q=2$

$\hookrightarrow A+A+A=3A=72 \Rightarrow A=\frac{72}{3} \Rightarrow d=0$

$\to 9q^6 = 9aq^3 = a \to q=1$

$\Rightarrow a = A+9d = A+da = A \Rightarrow 9d=0 \Rightarrow d=0$ ✗

غیرمجاز

$q=2 \Rightarrow a+a+a=72 \Rightarrow \boxed{a=\frac{72}{3}}$

PAPCO

$\Rightarrow 72$ ~~$\frac{72}{2} + d + \frac{72}{2} + 9d = 72$~~

کوئیز عالی

ادامه (۱۰)

$\boxed{q=۲} \rightarrow q^۳ = ۸ \;,\; q^۶ = ۶۴$

$a + aq^۳ + aq^۶ = ۷۳$

$a + ۸a + ۶۴a = ۷۳$

$۷۳a = ۷۳ \Rightarrow \boxed{a = ۱}$

$a_۱ = ۱ \;,\; a_۴ = ۸ \;,\; a_۷ = ۶۴$

$A_۲ = A_۱ + d \rightarrow ۸ = ۱ + d \Rightarrow d = ۷$

$A_{۱۰} = A_۱ + ۹d \Rightarrow ۶۴ = ۱ + ۶۳ \Rightarrow ۶۴ = ۶۴$ ✓

$q = ۱ \rightarrow d = ۰$

غلط است.

$\boxed{q = ۲ \longrightarrow d = ۷}$