نام و نام خانوادگی ...[illegible]... پاسخنامه تشریحی تکلیف شماره ...۱۲... کلاس ...دهم تجربی A...

۱۸/۵

**۱** (۱/۷۵)

$a + aq + aq^2 = 21$

$a(1+q+q^2) = 21$

$a \times aq \times aq^2 = a^3q^3 = 64$

$(aq)^3 = 64$

$aq = 4$

$\frac{4}{q} = a$

$\frac{4}{q}(1+q+q^2) = 21$

$1+q+q^2 = \frac{21}{4}q$

$1+q+q^2 - \frac{21}{4}q = 0$

$1 - \frac{17}{4}q + q^2 = 0$

$q = \frac{32}{8} = 4$ ×

$q = \frac{2}{8} = \frac{1}{4}$ ✓

q باید عدد حسابی باشه!

نمی‌تونه غیرحسابی باشه $\boxed{\cancel{\frac{1}{4}}}$

**۲** (۲)

$x^2+4,\ 2x,\ x^2-2$

$(2x)^2 = (x^2+4)(x^2-2)$

$4x^2 = x^4 - 2x^2 + 4x^2 - 8$

$4x^2 = x^4 + 2x^2 - 8$

$0 = x^4 - 2x^2 - 8$

$x^2 = t$

$t^2 - 2t - 8 = 0$

$t = \frac{2 \pm \sqrt{4+32}}{2} = \frac{2 \pm 6}{2}$

$\boxed{t = 4}$ یا $\cancel{t = -2}$

چون $x^2$ نمی‌تونه منفی باشه

$x = \cancel{\pm}2 \Rightarrow x = 2$

مثبت است $q > 0$

$a_1 = 2^2+4 = 8$

$a_2 = 4$

$a_3 = 2^2 - 2 = 2$

$q = \frac{a_2}{a_1} = \frac{4}{8} = \frac{1}{2}$

$S_7 = a \times \frac{1-q^7}{1-q}$

$S_7 = 16 \times \frac{127}{128}$

$S_7 = \boxed{\frac{127}{8}}$ ✓

**۳** (۱/۷۵)

$1+q+q^2+q^3+q^4 = \frac{1-q^5}{1-q} = \frac{\cancel{\ }\ 121}{81}$ دقت!

$\frac{1-q^5}{1-q} = \frac{\cancel{\ }\ 131}{81}$

$S_5 = a_1 \times \frac{1-q^5}{1-q} \Rightarrow S_5 = 243 \times \frac{\cancel{\ }\ 121}{81} = \boxed{\cancel{384}}$ $\boxed{363}$

**۴** (۱/۵)

$q = \sqrt[6]{64} = 2$ یا $q = -2$ $\quad B = -8 \quad A + B = \boxed{24.5}$

$1, 2, 4, \boxed{8}, 16, 32, 64$ B

$8 + 32.5 = \boxed{40.5}$ ✓

$B + A$

$a_7 = a_1 + 6d = 64$

$1 + 6d = 64$

$6d = 63$

$d = 10.5$

$1, 11.5, 22, \boxed{32.5}, 43, 53.5, 64$ A

**۵** (۲)

$-24, -\frac{95}{4} = -23.75, \ldots$

$d = 0.25$

$a_{101} = -24 + 100 \times 0.25 = -24 + 25 = 1$

$x_8 = x_1 \times q^7 = 1 \Rightarrow 128 \times q^7 = 1 \quad q = \boxed{\frac{1}{2}}$ ✓

احسن رضا طوزنی    دهم شنبه‌ها

**۶** (۲)

$a_3 = a_1 + 2d \qquad a_7^2 = a_3 \times a_9$

$a_7 = a_1 + 6d$

$(a_1 + 6d)^2 = (a_1 + 2d)(a_1 + 8d) \Rightarrow 2d(a_1 + 10d) = 0$

$a_9 = a_1 + 8d$

$d = -\frac{a_1}{10}$ در غیر این صورت $d = 0$ که ثابت می‌شود

درسته!

$r = \frac{a_7}{a_3} = \frac{a_1 + 6d}{a_1 + 2d} = \frac{1}{2}$ یا $\cancel{1}$

$$\boxed{d = -\frac{a_1}{10} \qquad r = \frac{1}{2}}$$

**۷** (۲)

$b_1 = a_2 \qquad (a_4)^2 = a_2 \times a_8 \qquad b_{10} = b_1 \times q^9 = \frac{1}{4} \times 2^9$

$b_2 = a_4 \qquad (a_1 + 3d)^2 = (a_1 + d)(a_1 + 7d) \qquad 2^9 = 512$

$b_3 = a_8 \qquad a_1^2 + 6a_1d + 9d^2 = a_1^2 + 8a_1d + 7d^2 \qquad b_{10} = \frac{1}{4} \times 512 = \boxed{128}$

$6a_1d + 9d^2 = 8a_1d + 7d^2 \qquad b_1 = a_2 = a_1 + d = a_1 + a_1 = 2a_1$

$b_3 \times b_1 = b_2^2 \qquad 9d^2 - 7d^2 = 8ad - 6ad \qquad b_1 = \frac{1}{4} \quad 2a_1 = \frac{1}{4} \quad a_1 = \frac{1}{8}$

$2d^2 = 2ad \qquad d^2 = ad \qquad d(d - a) = 0$

**۸** (۲)

هندسی $\quad r^3a,\ r^2a,\ ra,\ a$

حسابی $\quad 3ra,\ 2r^2a,\ r^3a$

$2(2ar^2) = 3ar + ar^3$

$4ar^2 = 3ar + ar^3$

$4r^2 = 3r + r^3 \;/\; r^3 - 4r^2 + 3r = 0$

$r(r-1)(r-3) = 0 \qquad r = \boxed{3}$

**۹** (۲)

$a_1 = 2,\ a_2 = \frac{7}{4} \qquad \left(\frac{1}{4} + d\right)^2 = \left(\frac{5}{4} + d\right)(-1 + d)$

$d = -\frac{1}{4} \qquad a_{13} = -1 \qquad d^2 + \frac{1}{2}d + \frac{1}{16} = d^2 + \frac{1}{4}d - \frac{5}{4}$

$a_n = \frac{9 - n}{4} \qquad b_1 = \frac{5}{4} + d \qquad \frac{1}{4}d = -\frac{21}{16} \Rightarrow d = -\frac{21}{4}$

$a_4 = \frac{5}{4} \qquad b_2 = \frac{1}{4} + d \qquad b_1 = -4,\ b_2 = -5$

$a_8 = \frac{1}{4} \qquad b_3 = -1 + d \qquad q = \frac{-5}{-4} = \boxed{\frac{5}{4}}$

**۱۰** (۱٫۵)

$a + ar^3 + ar^6 = 73 \qquad a + 9ar^3 + 8a = 0$

$a(1 + r^3 + r^6) = 73 \qquad a(r^6 - 9r^3 + 8) = 0 \qquad r^3 = 8 \quad r = 2$

$a + 9d,\ a + d,\ a \qquad r^6 - 9r^3 + 8 = 0 \qquad a(1 + 8 + 64) = 73$

$a + d = ar^3 \qquad x = r^3 \qquad a \times 73 = 73 \quad a = 1$

$d = ar^3 - a \qquad x^2 - 9x + 8 = 0 \qquad d = ar^3 - a = 8 - 1 = 7$

$a + 9d = ar^6 \qquad (x-1)(x-8) = 0 \qquad \boxed{7}$

$r^3 = 8$ یا $\cancel{1}$

حالت دوم (دنباله ثابت) → $q = 1 \qquad d = 0$