

۱۹۷۵

نام و نام خانوادگی فرم ۳ علییراست پاسخنامه تشریحی تکلیف شماره ۱۴ کلاس

۱) $\frac{1}{r}, \frac{1}{r^2}, \dots, a_n = \frac{1}{r} \times r^{n-1} \quad a_{10} = \frac{1}{r} \times r^9 = \boxed{209} \checkmark$ (الف)

$\frac{a_{10}}{a_1} = \frac{\frac{1}{r} \times r^{10}}{\frac{1}{r} \times r^1} = r^9 = 1024 \Rightarrow r = 2 \Rightarrow \boxed{1024} \checkmark$ (ب)

$b^2 = (\frac{1}{r} \times r^5) (\frac{1}{r} \times r^9) = \frac{1}{r^2} \times r^{14} = b^2 \Rightarrow b^2 = r^6 \Rightarrow b = r^3 \Rightarrow b = 8 \Rightarrow \boxed{8} \checkmark$ (ج)

$100 = \frac{1}{r} \times r^{n-1} \Rightarrow 100 = r^{n-1} \Rightarrow r = 10 \Rightarrow \boxed{n=9} \checkmark$ (د)

$a_{10} = 12 \Rightarrow \frac{ar^9}{ar^1} = r^8 = 12 \Rightarrow r = 2$

$ar^1 = 12 \Rightarrow a \times 2 = 12 \Rightarrow a = \frac{12}{2} = 6$

$a_n = 6 \times 2^{n-1} \Rightarrow a_{10} = 6 \times 2^9 = 3072 \Rightarrow \boxed{3072} \checkmark$

$a_1 \times a_2 \times a_3 \times a_4 \times a_5 = 24 \Rightarrow a_1 \times a_5 = 24 \Rightarrow \boxed{a_1 = 4} \checkmark$ (الف)

$a_1 \times a_5 = a_3^2 \Rightarrow 4 \times 24 = 9 \Rightarrow \boxed{9} \checkmark$ (ب)

$(\sqrt{2})^a = 2^a \times 2^{b/2} \Rightarrow 2^a = 2^{a+b/2} \Rightarrow a+b=0$

$\frac{a+b}{2} = \frac{0}{2} \Rightarrow \boxed{\frac{a+b}{2} = 0} \checkmark$ (ج)

$z^2 = \frac{(n+1)(1-z)}{1+z} \Rightarrow z^2 = 1 - z^2 \Rightarrow 2z^2 = 1$

$\Rightarrow z^2 = \frac{1}{2} \Rightarrow z = \pm \frac{1}{\sqrt{2}}$

فقط حالت (+) قابل قبول است زیرا به ازای $z = -\frac{1}{\sqrt{2}}$ حالت فرد با هم غیر هم علامت می شوند.

$a + ar^r = rn \Rightarrow a(1+r^r) = rn \Rightarrow a = \frac{rn}{1+r^r}$ $ar + ar^r = 1r \Rightarrow ar(1+r) = 1r \Rightarrow a = \frac{1r}{r(1+r)} \Rightarrow \frac{1r}{r(1+r)}(1+r^r) = rn$ $\frac{1r(1+r^r)}{r(1+r)} = rn \Rightarrow 1r(1+r^r) = rn r(1+r) \Rightarrow 1r + 1r r^r = rn r + rn r^r$ $1r r^r - rn r^r - rn r + 1r = 0 \Rightarrow r^r - nr^r - nr + r = 0 \Rightarrow r = c \Rightarrow c(r^r) - v(r^r) - v(r) + r = 0$ $a = \frac{1r}{c + (1+r^r)} = \frac{1r}{1r} = 1 \Rightarrow a_1, a_2, a_3, a_4 = 1, c, q, 2v \quad \checkmark \quad \boxed{1r} \quad \checkmark$	6
$P_r = (v) \quad r^r = c^r \Rightarrow aq = c \Rightarrow a = \frac{c}{q}$ $S_r = a + aq + aq^r = \frac{c}{q}(1 + q + q^r) \stackrel{a}{=} 1c q = c(1 + q + q^r) \Rightarrow q = \frac{10 + \sqrt{91}}{9} = \frac{10 + \sqrt{91}}{9}$ $\Rightarrow q = c, \frac{1}{c} \quad \checkmark$ $1^r q = c + c q + c q^r \Rightarrow c q^r - 10q + c = 0$ $a = \frac{c}{q} \Rightarrow 10 q = c \Rightarrow a = c \Rightarrow 1, c, q \quad 2, q = \frac{1}{c} \Rightarrow a = q \Rightarrow \checkmark, c, 1$	7
$a_n = \underbrace{r, q, 1, q, \dots}_{a \leftarrow c \leftarrow c} \quad a_n = r \alpha c^{n-1}$ $S_n = \frac{r \alpha (c^n - 1)}{c - 1} = \boxed{c^{10} - 1} \quad \checkmark$ $P_n = \sqrt{(r - r \alpha c^9)10} = \sqrt{(r \frac{10}{c} - c^{10})} = \boxed{r^{10} \times r^{10}} \quad \checkmark$ $a_{10} = r \alpha c^9$	(ف) 8
$a_n = a, aq, aq^2, aq^3, \dots$ $\left. \begin{aligned} b_1 &= aq - a = a(q-1) \\ b_2 &= aq^2 - aq = aq(q-1) \\ b_3 &= aq^3 - aq^2 = aq^2(q-1) \end{aligned} \right\} a(q-1), aq(q-1), aq^2(q-1), \dots$ $\frac{b_1}{b_2} = \frac{aq(q-1)}{a(q-1)} = q = \frac{r}{c} \quad \checkmark$	9
$S_n = a_1 + a_1 q + a_1 q^2 + \dots + a_1 q^{n-1} \xrightarrow{aq} S_n q = a_1 q + a_1 q^2 + \dots + a_1 q^n$ $\checkmark S_n - S_n q = a_1 - a_1 q^n \Rightarrow S_n = (1 - q) \Rightarrow a_1 = (1 - q) \Rightarrow S_n = \frac{a_1 (q^n - 1)}{q - 1}$ $S_n = \frac{a_1 (1 - q^n)}{1 - q} \quad \left\{ S = a + (a+d) + \dots + (a+(n-1)d) \right. \quad S = (a+(n-1)d) + (a+(n-2)d) + \dots + a \quad \checkmark$ $rS = (ra + (n-1)d) + (ra + (n-1)d) + \dots + (ra + (n-1)d)$ $LrS = n \alpha (ra + (n-1)d) \quad S = \frac{n}{r} \alpha (ra + (n-1)d) \quad \checkmark$	(ع) 10