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Date

مهرتان باقری — تکلیف ۱۴ — دهم تجربی

①

الف) $a_n = \frac{1}{2}, 1, 2, \dots$ ($\times 2$, $\times 2$)

$a_{10} = ar^{n-1} = \frac{1}{2} \times 2^9 = 2^8 = 256$

ب) $\frac{a_{17}}{a_{13}} = r^4 = 2^4 = 16$

ج) $a_4 = ar^3 = \frac{1}{2} \times 2^3 = 4$

$a_{10} = ar^9 = \frac{1}{2} \times 2^9 = 256$

$\sqrt{256 \times 4} = \sqrt{1024} = 32$

د) $ar^{n-1} = \frac{1}{2} \times 2^{n-1} \Rightarrow 2^{n-2} = 128 = 2^7$

$n - 2 = 7 \Rightarrow n = 9$

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②

$aq^4 = 12$, $aq^7 = 96 \Rightarrow q^3 = \frac{96}{12} = 8 \Rightarrow q = 2$

$aq^4 = 12$, $a2^4 = 12$, $16a = 12 \Rightarrow a = \frac{12}{16}$

$a_{10} = aq^9 = \frac{12}{16} \times 2^9 = 12 \times 2^5 = 12 \times 32 = 384$

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③

$a^5 q^{10} = 243 \longrightarrow (aq^2)^5 = 243 = 3^5 \Rightarrow aq^2 = a_3 = 3$

الف) $a_3 = aq^2 = 3$

ب) $a_1 \times a_5 = a^2 q^4 = (aq^2)^2 = 3^2 = 9$

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④

$(4\sqrt{2})^2 = 2^a \times 2^b = 32 = 2^{a+b} = 2^5 \Rightarrow a + b = 5$

واسطه حسابی $= \frac{a+b}{2} = 2.5$

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⑤

$aq^2 = 1 - x$, $aq^6 = x$, $aq^{10} = x + 1$

$q^4 = \frac{x}{1-x}$, $q^4 = \frac{x+1}{x}$

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

$x^2 = x - x^2 + 1 - x$

$2x^2 = 1$

$x^2 = \frac{1}{2}$

$x = \pm \frac{1}{\sqrt{2}}$

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④

$a+aq^3=28 \longrightarrow a(1+q^3)=28$ ☆

$aq+aq^2=12 \longrightarrow aq(1+q^2)=12$

$$\frac{a(1+q)(1+q^2-q)}{aq(1+q^2)}=\frac{28}{12}=\frac{1-q+q^2}{q}=\frac{7}{3} \Rightarrow 7q=3-3q+3q^2$$

$$3q^2-10q+3=0$$

روش سهمی $\Rightarrow q^2-10q+9=0 \Rightarrow (q-1)(q-9)=0$

$q=\frac{1}{3}$ ← ، $q=\frac{9}{3}$ ←

☆ $a(1+3^3)=28 \Rightarrow a=1 \Rightarrow 1, 3, 9, 27$

☆ $a(1+(\frac{1}{3})^3)=28 \Rightarrow a=27 \Rightarrow 27, 9, 3, 1$

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⑦

$a+aq+aq^2=13$

$a \times aq \times aq^2=a^3q^3=(aq)^3=3^3 \Rightarrow aq=3$

$\frac{3}{q}+3+3q=13 \xrightarrow{\times q} 3+3q+3q^2=13q \quad 3+3q^2=10q \Rightarrow 3q^2-10q+3=0$

$q^2-10q+9=0 \Rightarrow (q-1)(q-9)=0$

$q=1 \xrightarrow{\div 3}$ روش تقسیم $q=\frac{1}{3}$ $\boxed{9, 3, 1}$

$q=9$ روش تقسیم $q=3$ $\boxed{1, 3, 9}$

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⑧

الف) $S_{10}=2\left(\frac{1-3^{10}}{1-3}\right)=3^{10}-1$

ب) $a_{10}=2\times 3^9$

$\sqrt{(a_1 \times a_{10})^{10}}=$

$(2\times 2\times 3^9)^5=(4\times 3^9)^5$

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(9)

$a , aq , aq^2 , aq^3 , aq^4 , \dots$

$aq^4 - aq^3 = aq^3(q-1)$ ×q

$aq^3 - aq^2 = aq^2(q-1)$ ×q $\quad q = q$

$aq^2 - aq = aq(q-1)$ ×q

$aq - a = a(q-1)$

(10)

ا) $a_1 , a_2 , a_3 , \dots , a_n$

$a + (a+d) + (a+2d) + \dots + (a+(n-1)d)$

$\frac{a + a + (n-1)d}{2} \times n \Rightarrow \frac{n}{2}(2a + (n-1)d)$

ب) $S = a_1 + a_2 + a_3 + \dots + a_n$

$(S = a + aq + aq^2 + \dots + aq^{n-2}) \times q$

$qS = aq + aq^2 + aq^3 + \dots + aq^n$

$S - Sq = a - aq^n$

$S(1-q) = a(1-q^n) \Rightarrow S = \frac{a(1-q^n)}{1-q}$ یا $S = \frac{a(q^n-1)}{q-1}$

PAPCO