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نام و نام خانوادگی ..... کلاس ..... پاسخنامه تشریحی تکلیف شماره ۱۴

$$a_n = \frac{1}{r}, 1, r, \dots \quad a_n = ar^{n-1} = \frac{1}{r} \times r^{n-1} = r^{n-2}$$

الف)  $a_{10} = ? \rightarrow r^8 = 254$

ب)  $\frac{a_{14}}{a_{12}} = ? \rightarrow \frac{r^{12}}{r^{10}} = r^2 = 14$

ج)  $q^2 = \frac{r^8}{r^2} \Rightarrow q^2 = r^6 \rightarrow q = \pm 1 \rightarrow \boxed{A = 32} \quad \boxed{B = 32}$

د)  $t_n = r^7 \rightarrow n = 9$

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واسطه بین ۱ و ۱۰  
 $a_v = a_1 \times q^4$   
 $\frac{1}{r} \times r^4 = 32$

$a_5 = 12 \rightarrow r^3 = \frac{94}{12} = 1 \rightarrow r = 1$

$a_8 = 94 \rightarrow r^2 = r^2 = 4$

$a_{10} = 94 \times 4 = 376$

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الف)  $a_{13} = 256 \rightarrow a_{13} = 16$

ب)  $a_1 \times a_5 = a_{13} = 16$

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$3r = r^{a+b} \rightarrow a+b = 5$

واسطه میان =  $\frac{a+b}{r} = \frac{5}{r} = 1, 0$

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$a_{12} = 1-x$   
 $a_{11} = x$   
 $a_{10} = x+1$   
 $1-x^2 = x^2$   
 $2x^2 = 1 \rightarrow x = \pm 1$

$rx^2 = 1$   
 $x^2 = \frac{1}{r}$   
 $x = \pm \sqrt{\frac{1}{r}}$

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|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| $a_1 + a_8 = 2A$ $a_1 + a_8 = 1P$ $a_1 + a_1 r^7 = 2A \rightarrow a_1(1 + r^7) = 2A \rightarrow a_1 = \frac{2A}{1 + r^7}$ $a_1 r + a_1 r^8 = 1P \rightsquigarrow \frac{2A}{1 + r^7} (r + r^8) = 1P$ $\Rightarrow 2A(r + r^8) = 1P(1 + r^7) \rightarrow 2Ar + 2Ar^8 = P + Pr^7 \rightarrow Pr^7 - 2Ar^8 - 2Ar + P = 0$ $r = 3 \leq r = \frac{1}{P}$ $1, P, A, 2V$ $2V, A, P, 1$ $\rightsquigarrow (2V)$                                                                                                                        | <p>6</p>                                                                                                                                                                                                                                                                                                                                                                                                                               |
| $a_1(1 + r + r^2) = 1P$ $a_1 r + a_1 r^2 = 2V$ $a_1 r = P = a_1$ $\frac{P}{r} + P + Pr = 1P$ $\frac{1}{r} + 1 + r = \frac{1P}{P}$ $\frac{r^2 + r + 1}{r} = \frac{1P}{P} \rightarrow Pr^2 + Pr + P = 1Pr \rightarrow Pr^2 - 1or + P = 0$                                                                                                                                                                                                                                                                                       | <div style="display: flex; align-items: center;"> <div style="border: 1px solid black; padding: 2px; margin-right: 10px;">1, P, A</div> <div style="border: 1px solid black; padding: 2px; margin-right: 10px;">A, P, 1</div> <div style="margin-left: 20px;"> <math display="block">r = \frac{10 \pm \sqrt{100 - 44}}{4} = \frac{6 \pm 4}{4} \rightarrow r = \begin{cases} P \\ \frac{1}{P} \end{cases}</math> </div> </div> <p>7</p> |
| $S_{10} = X \left( \frac{P^{10} - 1}{\frac{P - 1}{r}} \right) = P^{10} - 1 = \underline{29.4A} \quad (\text{في})$ $\Rightarrow a_1^{10} \times r^{1 \cdot 10 \rightarrow 9} = a_1^{10} \times r^{90} = \underline{r^{10} \times P^{90}}$                                                                                                                                                                                                                                                                                      | <div style="text-align: right;"> <math display="block">\begin{array}{r} PEP \\ \times EP \\ \hline VPQ \\ \times VPQ \\ \hline 1PA400 \\ \hline 2940A \end{array}</math> </div> <p>8</p>                                                                                                                                                                                                                                               |
| $a_1 \xrightarrow{\times q} a_1 q \xrightarrow{\times q} a_1 q^2 \xrightarrow{\times q} a_1 q^3 \dots \rightarrow a_1 q^{n-1}$ $+ a_1(q-1) \xrightarrow{\times q} + a_1 q(q-1) \xrightarrow{\times q} + a_1 q^2(q-1) \xrightarrow{\times q} + a_1 q^3(q-1) \dots \rightarrow a_1 q^{n-1} \rightsquigarrow a_1 = a_1(q-1)$ $+ a_1(q-1)(q-1) \xrightarrow{\times q} + a_1 q(q-1)(q-1) \xrightarrow{\times q} + a_1 q^2(q-1)(q-1) \dots \rightarrow a_1 q^{n-1} \rightsquigarrow a_1 = a_1(q-1)(q-1)$ $\vdots$                   | <p>9</p>                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <p>في) <math>a_1 + a_4 = a_2 + a_5 = a_3 + a_6 \leq a_1 + a_8 = a_7 + a_9 = 2a_6</math></p> $S_4 = P(a_1 + a_4) = \frac{n}{P}(a_1 + a_4) = \frac{n}{P}(a_1 + a_8) \quad S_8 = P(a_1 + a_8) + \frac{1}{P}(a_1 + a_8) = \frac{A}{P}(a_1 + a_8) = \frac{n}{P}(a_1 + a_8)$ <p>في) <math>S_n = a + ar + ar^2 + \dots, S_n r = ar + ar^2 + ar^3 + \dots</math></p> $S_n r - S_n = (ar + ar^2 + \dots) - (a + ar + \dots)$ $S_n r - S_n = ar^n - a$ $S_n(r-1) = a(r^n - 1) \rightarrow S_n = a \left( \frac{r^n - 1}{r - 1} \right)$ | <p>10</p>                                                                                                                                                                                                                                                                                                                                                                                                                              |