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

$a_n = \frac{1}{2}\times(2)^{n-1} = 2^{n-2}$ الف) $a_{10} = 2^{8} = \boxed{256}$ ب) $\frac{2^{15}}{2^{11}} = 2^{4} = \boxed{16}$ ج) $a_7 = 2^{5} = \boxed{32}$ د) $2^{n-2} = 128 \Rightarrow n = \boxed{9}$	۱
$d = \frac{96-12}{3} = 28$ $a_{10} = a_8 + 2d = 96 + 56 = \boxed{152}$	۲
الف) $\cancel{a}q^{-2}\times \cancel{a}q^{-1}\times a\times \cancel{a}q\times \cancel{a}q^{2} = 243 \Rightarrow a_3^{5} = 243 \Rightarrow a_3 = 3$ ب) $a_1\times a_5 = (a_3)^{2} \Rightarrow a_1\times a_5 = \boxed{9}$	۳
$32 = 2^{a}\times 2^{b} \Rightarrow 2^{5} = 2^{a+b}$ $\Rightarrow a+b = 5$ $\frac{a+b}{2} = \frac{5}{2} = \boxed{2/5}$	۴
$x^{2} = (1+x)(1-x) \Rightarrow x^{2} = 1 - x^{2}$ $\Rightarrow 2x^{2} = 1 \Rightarrow x = \boxed{\pm\frac{1}{2}}$	۵

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$$a_1+a_4=28 \Rightarrow a+aq^3=28 \Rightarrow a(1+q^3)=28 \qquad \frac{1+q^3}{q+q^2}=\frac{7}{3}$$ ۶

$$a_2+a_3=12 \Rightarrow aq+aq^2=12 \Rightarrow a(q+q^2)=12$$

$$7q+7q^2=3+3q^3 \Rightarrow 3q^3-7q^2-7q+3=0 \Rightarrow (q+1)(3q^2-10q+3)=0$$

$$q=-1 \qquad \frac{10\pm\sqrt{100-36}}{6} \begin{cases} \frac{10+8}{6}=3 \\ \frac{10-8}{6}=\frac{2}{6}=\frac{1}{3} \end{cases}$$

$$q=3 \qquad q=\frac{1}{3}$$

$$a_1+a_2+a_3=13 \Rightarrow a_1+a_3=10 \Rightarrow a+aq^2=10 \Rightarrow a(1+q^2)=10$$

$$a_1\times a_2\times a_3=27 \Rightarrow \frac{a_2}{q}\times a_2\times a_2 q=27 \Rightarrow a_2^3=27 \Rightarrow a_2=3$$ ۷

$$\left.\begin{matrix} a_1+a_3=10 \\ a_1\times a_3=9 \end{matrix}\right\} a_1=1,\ a_2=3,\ a_3=9$$

$$a_n=2(3)^{n-1}$$

$$S_{10}=2\left(\frac{3^{10}-1}{3-1}\right)=3^{10}-1=59048$$ ۸

$$a\times aq\times aq^2\times\cdots\times aq^9=a^{10}q^{\frac{9\times10}{2}} \Rightarrow 2^{10}\times 3^{45}$$

$$a_n=a,\ aq,\ aq^2,\ \ldots,\ aq^{n-1} \qquad a'_n=a(1-q),\ aq(1-q),\ \ldots,\ aq^{n-2}(1-q)$$

$$a-aq=a(1-q) \qquad q'=\frac{aq\cancel{(1-q)}}{a\cancel{(1-q)}}=\boxed{q}$$ ۹

$$aq-aq^2=aq(1-q)$$

$$\vdots$$

$$aq^{n-2}-aq^{n-1}=aq^{n-2}(1-q)$$

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

$$=na+\frac{n(n-1)}{2}d=\frac{n}{2}(2a+(n-1)d)\ \checkmark$$

$$\left.\begin{matrix} a+aq+aq^2+\cdots+aq^{n-1}=S_n \\ aq+aq^2+aq^3+\cdots+aq^n=S_n q \end{matrix}\right\} S_n-S_n q=a_1-aq^n$$ ۱۰

$$S_n(1-q)=a_1(1-q^n)$$

$$\Rightarrow S_n=\frac{a_1(1-q^n)}{1-q}\ \checkmark$$