پاسخ آنالیز ۵ ۱۸/۱۷۵

۱) ۲

$a_n = \frac{1}{2}, 1, 2, \ldots \quad q=2$

$aq^9 = \frac{1}{2}(2)^9 = \boxed{256} \quad aq^3 = \boxed{4}$

$\frac{a_{17}}{a_{13}} = \frac{q^{16}}{q^{12}} = 2^{16}\times 2^{-12} = 2^4 = \boxed{16}$

$256\times 4 = b^2 \to b^2 = 1024 \to b = 2^5 = 32$

$128 = \frac{1}{2}(2)^{n-1} \to 128 = 2^{-1}\times 2^n \times 2^{-1} \to 128\times 4 = 2^n \quad \boxed{n=9}$

۲) ۲

$aq^4 = 12 \quad aq^7 = 96 \quad \frac{q^7}{q^4} = \frac{96}{12} \to q=2$

$a_8 = 96 \quad a_{10} = 96\times 4 = 384$

۳) ۲

$\underbrace{a_1\times \overbrace{a_2\times a_3\times a_4}^{a_3\times a_3} \times a_5}_{a_3\times a_3} = 243 \to a_3^5 = 243$

$\boxed{a_3 = 3}$

$\boxed{a_1\times a_5 = 9}$

۴) ۲

$2^a, 4\sqrt{2}, 2^b \to 2^a\times 2^b = 32 \to 2^{a+b} = 32$

$a+b=5$ واسطه $= \boxed{\frac{5}{2}}$

$a+b = 2c$

۵) ۱/۱۷۵

$x+1, \quad x, \quad 1-x$

$11 \xleftarrow{4} 7 \xleftarrow{4} 3$

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

$x - x^2 + 1 - x = x^2 \to 1-x^2 = x^2 \to 2x^2 = 1 \to x^2 = \frac{1}{2} \quad x = \pm\sqrt{\frac{1}{2}}$

۶)

فقط $x = \frac{-\sqrt{2}}{2}$ قابل قبول است

۶) ۲

$aq+aq^2=12 \quad aq(1+q)=12 \Rightarrow 1+q=\frac{12}{aq}$ *

$\frac{a(1-q^4)}{1-q}=40 \Rightarrow \frac{12(1+q^2)}{q}=40 \quad \frac{a_1(1-q)(1+q)(1+q^2)}{1-q}=40$

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

$aq+a+aq^2=13 \to a+aq^2=10$

$a(1+q^2)=10 \quad \boxed{a_1=27}$

۷) ۱

$a^3q^3=27 \to aq=3$

$a=\frac{3}{q} \quad \frac{3}{q}+3q=10 \to 3+3q^2-10q=0$

$\Delta=100-36=64$

$\frac{10\pm8}{6}=\frac{2}{6},3$ ✓

$\left.\begin{array}{l} a=1 \\ q=3 \end{array}\right\} \to$

$q=3 \to 1,3,9$

$q=\frac{1}{3} \to 9,3,1$

$a_n=2,6,18,\ldots$

۸) ۳

$S_{10}=a\left(\frac{q^{10}-1}{q-1}\right) \to 2\left(\frac{3^{10}-1}{2}\right)=\boxed{3^{10}-1}$

$a^n\times r^{\frac{n(n-1)}{2}} \to 2,\ 2\times3,\ 2\times3^2,\ \ldots\ldots \quad \boxed{2^{10}\times3^{45}}$

* ب :

۹) ۲

$a,\ aq,\ aq^2,\ aq^3,\ aq^4,\ aq^5$

$(aq-a),\ (aq^3-aq^2),\ (aq^5-aq^4)$

$(aq^5-aq^4)(aq-a)=(aq^3-aq^2)^2$

$a^2q^6-a^2q^5-a^2q^5+a^2q^4=a^2q^6+a^2q^4-2a^2q^5$ ✓

$q'=\frac{aq^3-aq^2}{aq-a} \to \frac{\cancel{a}(q^3-q^2)}{\cancel{a}(q-1)} \to \frac{q^2(q-1)}{q-1}=\boxed{q^2}$

۵/۱۰

$$S_n = \frac{n}{2}\left(2a+(n-1)d\right) \Rightarrow$$

$$a_1, \dots, a_n \rightarrow a_1+a_n = a_2+a_{n-1} = a_3+a_{n-2} = \dots$$

$$\frac{n}{2}\left[a_1+a_n\right] = \frac{n}{2}\left[a_1+(n-1)d\right]$$

$$a_1+a_2+a_3+\dots a_n = a+aq+aq^2 \dots aq^{n-1}$$

$$S_n = a\left(\frac{q^n-1}{q-1}\right)$$

$$a_1(1+q+q^2+\dots+q^n)\frac{(1-q)}{1-q}$$

$$a_1\frac{(1-q^n)}{(1-q)}$$

$$a_1, \dots, a_n \rightarrow a_1+a_n = a_2+a_{n-1} = a_3+a_{n-2} = \dots$$