

$$a_n = \frac{1}{r}, 1, r, \dots \Rightarrow a_1 = \frac{1}{r} \quad r = 2 \Rightarrow a_n = a_1 \times r^{n-1} = \frac{1}{r} \times 2^{n-1} = 2^{n-2}$$

$$n=1 \Rightarrow a_{10} = 2^{10-2} = 2^8 = 256$$

$$\frac{a_{17}}{a_{13}} = q^4 = r^4 = 16$$

$$b^2 = \sqrt{ac} \quad a_8 = 2^6 \Rightarrow \sqrt{ac} = b^2 = \sqrt{2^{10}} \Rightarrow b = \pm 2^5 = \pm 32$$

$$a_n = 2^{n-2} = 128 \Rightarrow n-2 = 7 \Rightarrow \boxed{n=9}$$

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$$a_8 = 12$$

$$a_1 = 94 \Rightarrow \frac{a_1}{a_8} = q^7 = 1 \Rightarrow q = 1$$

$$a_1 \times r^8 = 12 \Rightarrow a_1 \times 14 = 12 \Rightarrow a_1 = \frac{12}{14} = \frac{6}{7}$$

$$a_{10} = a_1 \times r^9 = \frac{6}{7} \times 2^9 = \frac{6}{7} \times 512 = \boxed{512 \frac{6}{7}}$$

$$a_1 \times a_2 \times a_3 \times a_4 \times a_5 = a_1^5 \times r^{10} = 2^5 \times 3^2 = 3^6 \Rightarrow$$

$$(a_1 \times r^2)^5 = 3^6 \Rightarrow a_1 \times r^2 = \sqrt[5]{3^6} = 3$$

$$a_1 \times a_5 = a_1^2 \times r^8 = (a_1 \times r^2)^2 = 3^2 = \boxed{9}$$

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$$r^a, \sqrt[r]{r}, r^b \Rightarrow \frac{r^b}{r^{\frac{a}{r}}} = \frac{r^{\frac{a}{r}}}{r^a} \Rightarrow r^{a+b} = r^a \Rightarrow a+b=a$$

$$a, \frac{a}{r}, b \rightarrow \text{نسبتی مساوی} \Rightarrow \frac{a+b}{r} = \boxed{\frac{a}{r}}$$

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$$a_{10} = \frac{1}{1-n} \quad a_1 = n \quad a_{11} = 1+n$$

$$\frac{a_1}{a_{10}} = \frac{a_{11}}{a_1} = q^9 \Rightarrow \frac{n+1}{n} = \frac{n}{1-n} \Rightarrow n^2 = -n^2 + 1 \Rightarrow 2n^2 = 1$$

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

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$a_1 + a_2 = 11 \rightarrow a_1(1+q^2) = 11$ $a_2 + a_3 = 12 \rightarrow a_1 q(1+q) = 12$ $13q^2 - 13q + 11 = 12q \Rightarrow 13q^2 - 10q + 11 = 0$ $(13q-1)(q-11) = 0$ $q=11 \Rightarrow a_1 = \frac{11}{1+121} = 1 \Rightarrow 1, 13, 9, 121$ $q=\frac{1}{11} \Rightarrow a_1 = \frac{11}{1+\frac{1}{121}} = 121 \Rightarrow 121, 9, 13, 1 \Rightarrow 121, 9, 13, 1$	$\frac{a_1(1+q^2)(q^2-q+1)}{a_1 q(1+q)} = \frac{11}{12}$ $(13q-1)(q-11) = 0$ $121 = 121$	6
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$a_1 + a_2 + a_3 = 13 \Rightarrow a_1 \left(\frac{q^3-1}{q-1} \right) = a_1 (q^2+q+1) = 13$ $a_1 \times a_2 \times a_3 = 12 \Rightarrow a_1^3 (q^3) = 12 \Rightarrow a_1 q = 3 = a_2$ $\frac{13}{q} + 3 + 3q = 13 \Rightarrow 13 \left(\frac{1}{q} + 1 + q \right) = 13 \Rightarrow \frac{q^2+q+1}{q} = \frac{13}{3}$ $13q^2 + 13q + 3 = 13q \Rightarrow 13q^2 - 10q + 3 = 0$ $(13q-3)(q-1) = 0 \Rightarrow q=1 \Rightarrow a_1=1 \Rightarrow 1, 3, 9$ $q=\frac{1}{3} \Rightarrow a_1=9 \Rightarrow 9, 3, 1$	$13q^2 - 10q + 3 = 0$ $q=1 \Rightarrow a_1=1 \Rightarrow 1, 3, 9$ $q=\frac{1}{3} \Rightarrow a_1=9 \Rightarrow 9, 3, 1$	7
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$a_n = 2, 4, 8, \dots \Rightarrow a_1 = 2, q = 2 \Rightarrow a_n = 2 \times 2^{n-1}$ $S_{10} = a_1 \left(\frac{q^{10}-1}{q-1} \right) = 2 \left(\frac{2^{10}-1}{2-1} \right) = 2^{10} - 1$ $P_{10} = a_1 \times a_2 \times \dots \times a_{10} = a_1^{10} \times q^{1+2+\dots+9} = 2^{10} \times 2^{45}$	الف) ب)	8
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$a_1, a_2, a_3, \dots$ $a_2 - a_1 = a_1(q-1)$ $a_3 - a_2 = a_2(q-1) = a_1 q (q-1)$ $a_4 - a_3 = a_3(q-1) = a_1 q^2 (q-1)$... $a_n - a_{n-1} = a_{n-1}(q-1) = a_1 q^{n-2} (q-1)$	$a_1(q-1), a_1(q-1)q, a_1(q-1)q^2, \dots$ مجموع هاتين السلسلة = مجموع السلسلة	9
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$a_1 + a_2 + a_3 + \dots + a_n$ $\Rightarrow a_1 + (a_1 d) + (a_1 + d) + \dots + (a_1 + (n-1)d) = a_1 \times n + d(1+2+\dots+(n-1)) = \frac{n}{2} (2a_1 + (n-1)d) = S_n$	الف) ب)	10
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$\rightarrow \frac{A}{(q-1)A} = \frac{q + q^2 + q^3 + \dots + q^n}{1 + q + q^2 + \dots + q^{n-1}} = q^n - 1 \Rightarrow A = q^n - 1$