

Geometric Progression

$$q = 2 \quad a_{10} = a q^9 \Rightarrow \frac{1}{p} \times 2^9 = \boxed{256} \quad (الف) \quad (1)$$

$$\frac{a_{14}}{a_{13}} = \frac{a q^{14}}{a q^{13}} = q^1 \Rightarrow 2^x = 16 \quad (ب) \quad (2)$$

$$a_2 = a = a_1 \quad a_6 = a q^4 = \frac{1}{p} \times 2^4 = \boxed{16} \quad (ج) \quad (3)$$

$$128 = \frac{1}{p} \times q^{n-1} \quad \boxed{n=9} \quad (د) \quad (4)$$

$$a_2 = 12 \quad \frac{a_1}{a_2} = q^1 \quad \frac{q q}{12} = q^1 \quad (هـ) \quad (5)$$

$$a_{10} = 9 \Rightarrow a_{10} = a_1 q^9 \Rightarrow a_{10} = 9 q^9 \Rightarrow \boxed{1215} \quad (و) \quad (6)$$

$$\underbrace{a_1 \times a_2 \times a_3 \times a_4 \times a_5}_{q^5} = 256 \quad (ز) \quad (7)$$

$$a_{10} = 256 \Rightarrow \boxed{a_{10} = 16} \quad (ح) \quad (8)$$

$$a_1 \times a_9 = a_{10} \Rightarrow \boxed{9} \quad (ط) \quad (9)$$

$$(2\sqrt{2})^2 = 2^b \times 2^a \Rightarrow 22 = 2^{a+b} \quad (ق) \quad (10)$$

$$2d = a+b \Rightarrow \boxed{d = 11} \quad (ك) \quad (11)$$

$$a_1 \times a_2 = a_1^2$$

(4)

$$(1-n)(1+n) = n^2 \leadsto 1-n^2 = n^2$$

$$n^2 = \frac{1}{2} \Rightarrow n = \frac{\sqrt{2}}{2}$$

$$a_1 + a_2 = 21$$

$$a_2 + a_3 = 12$$

$$\frac{a(1+q^2)}{aq(1+q)} = \frac{(1+q)(1+q^2-q)}{(1+q)q} \quad (8)$$

$$\frac{1+q^2-q}{q} = \frac{21}{12}$$

$$\leadsto 12q^2 - 10q + 12 = 0$$

$$q = \frac{5}{12}$$

$$1, 5, 9, 14 / 14, 9, 5, 1$$

$$1495$$

$$a_1 + a_2 + a_3 = 12$$

(5)

$$a_1 \times a_2 \times a_3 = 14$$

$$\leadsto \frac{a}{q} \times a \times (aq) = 14 \Rightarrow n^2 = 14$$

$$n = 5$$

$$\frac{12}{q} + 12 + 12q = 12$$

$$\leadsto 12q^2 - 10q + 12 = 0$$

$$q = \frac{5}{12}$$

$$1, 5, 9 / 9, 5, 1$$

$$S_1 = 2 \times \frac{2^{10}-1}{2-1} = 2^{10}-1$$

(الف) (1)

$$a_1 \times a_2 \times \dots \times a_n = a_1^{10} \times q^{E\Delta}$$

$$(1.25 \times 10^{E\Delta})$$

(ب)

$$\left. \begin{array}{l} aq - a \\ aq^r - aq \\ aq^r - aq^r \end{array} \right\} \rightarrow \frac{(aq - a)(aq^r - aq^r)}{(aq^r - aq)^r} \quad (4)$$

$$a, aq, aq^r, \dots, aq^{n-1}$$

$$(aq - a), (aq^r - aq), \dots, (aq^{n-1} - aq^{n-2})$$

$$a(q-1), aq(q-1), \dots, aq^{n-1}(q-1)$$

$$q \leftarrow \frac{1}{10}$$

$$(1) a_1 + a_2 + a_3 + \dots + a_n$$

$$a_n + a_{n-1} + a_{n-2} + \dots + a_1 \rightarrow n+1$$

$$\rightarrow n(a_1 + a_n) \xrightarrow{\text{add}} \frac{n}{2} (a_1 + a_n)$$

$$(2) a + aq + aq^r + \dots + aq^{n-1}$$

$$\rightarrow \frac{a(1 + q + q^r + \dots + q^{n-1})}{q-1}$$

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