

$$a \times aq \times aq^2 = 4r$$

$$\rightarrow a^3 q^3 = 4r \rightarrow aq = r$$

$$a(1+q+q^2) = 21$$

$$\rightarrow \frac{1+q+q^2}{aq^2} = \frac{21}{14} \rightarrow \frac{1+q+q^2}{r} = \frac{21}{14}$$

$$\begin{aligned} 14q^2 - 41q + 14 &= 0 \\ 4q^2 - 11q + 4 &= 0 \\ \rightarrow q^2 - 11q + 14 &= 0 \\ (q-1)(q-14) &= 0 \end{aligned}$$

$$\rightarrow q = 1 \text{ یا } q = 14$$

$$(n^2+r)(n^2-r) = rn^2 \rightarrow n^4 + rn^2 - 1 = rn^2 \rightarrow n^4 - 2n^2 - 1 = 0$$

$$n^2 = r \rightarrow n = \pm \sqrt{r}$$

$$\begin{aligned} n = \sqrt{r} &\rightarrow \begin{cases} a_1 = 1 \\ a_2 = r \\ a_3 = r^2 \end{cases} \\ n = -\sqrt{r} &\rightarrow \begin{cases} a_1 = 1 \\ a_2 = -r \\ a_3 = r^2 \end{cases} \end{aligned}$$

$$(n^2-r)(n^2+r) = 0 \rightarrow \begin{cases} n^2 = r \\ n^2 = -r \end{cases}$$

$$\begin{aligned} a_1 &= n^2 + r \\ a_2 &= 2n \\ a_3 &= n^2 - r \end{aligned}$$

$$\text{پاسخ: } r = 1$$

در جواب اول، اگر $r = 1$ باشد، داریم:

$$S_5 = a_1(1+q+q^2+q^3+q^4) = \frac{121}{14} \times a_1$$

$$\frac{121}{14} + \frac{121}{14}q + \frac{121}{14}q^2 + \frac{121}{14}q^3 + \frac{121}{14}q^4 = 363$$

$$\text{پاسخ: } r = 1$$

$$A = \frac{4r+1}{2} = 3r, A$$

$$B^2 = 4r \times 1 \rightarrow B = \pm \sqrt{4r} = \pm 2\sqrt{r}$$

$$\begin{aligned} A &= 3r, A \\ B &= 1 \end{aligned} \rightarrow A+B = 4r, A$$

$$\begin{aligned} A &= 3r, A \\ B &= -1 \end{aligned} \rightarrow A+B = 2r, A$$

$$\text{پاسخ: } r = 1$$

$$a_n = -2r, -2r, \sqrt{4r}, \dots \rightarrow a_n = \frac{1}{n} - 2r, 2r$$

$$a_{1,1} = \frac{1}{1} \times 1 - 2r, 2r = 1$$

$$b_n = 121, a_2, \dots, a_n \rightarrow a_n = \frac{1}{121}$$

$$\text{پاسخ: } r = 1$$

$$q = \frac{1}{r}$$

$$\left. \begin{aligned} a_r &= a_1 + rd \\ a_v &= a_1 + vd \\ a_9 &= a_1 + 1d \end{aligned} \right\} \rightarrow (a_1 + vd)^r = (a_1 + rd)(a_1 + 1d)$$

$$a^r + 1rd + r^2d^2 = a^r + 10ad + 14d^2$$

$$\rightarrow 1rd = -10ad \rightarrow a = -10d$$

$$1ad + 10d^2 = 0 \rightarrow 1d(a + 10d) = 0$$

$$d = -\frac{a}{10}$$

د = -a/10

$$\left\{ \begin{aligned} a_r &= a + d \\ a_v &= a + rd \\ a_n &= a + vd \end{aligned} \right\} \rightarrow (a + d)(a + vd) = (a + rd)^r$$

$$a^2 + rad + vd^2 = a^2 + 9ad + 9d^2$$

$$rad = 9ad \rightarrow ad = d^2 \rightarrow a = d$$

$$a = r \rightarrow a_{10} = \frac{1}{r} \times r^9 = 121$$

د = 0

$$ra_q, ra_q^r, aq^r \rightarrow$$

$$ra_q^r = \frac{ra_q + aq^r}{r} \rightarrow ra_q^r = ra_q + aq^r$$

$$aq(rq) = q(q + r)$$

$$rq = r + q^r \rightarrow q^r - rq + r = 0$$

$$(q - r)(q - 1) = 0$$

q = 1

$$(n + a_r)(n + a_{1r}) = (n + a_1)^r$$

$$(n + \frac{a}{r})(n - 1) = (n + \frac{1}{r})^r$$

$$n + \frac{1}{r}n - \frac{a \times r}{r \times r} = n + \frac{1 \times r}{r \times r} + \frac{1}{19}$$

$$\frac{1}{r}n = -\frac{r-1}{19} \rightarrow n = -\frac{r-1}{r}$$

$$a_n = -\frac{r-1}{r}, -\frac{a}{r}, -\frac{ra}{r} \rightarrow q = \frac{a}{r}$$

$$a_n = -\frac{1}{r}, -\frac{a}{r}, -\frac{ra}{r}$$

$$a + aq^r + aq^v = vr^r$$

$$\left\{ \begin{aligned} a &= a \\ a + d &= aq^r \\ a + 9d &= aq^v \end{aligned} \right\} \rightarrow (a + d)^r = a(q + 9d)$$

$$a^r + rad + d^r = a^r + 9ad$$

$$d^r - vad = 0$$

$$d(d - va) = 0$$

$$d = va$$

$$d = 0$$

$$\frac{vr^r}{v}d = vr^r \rightarrow d = v$$

d = v