

$$a + aq + aq^2 = 21$$

$$a \times aq \times aq^2 = 48 \rightarrow \sqrt[3]{a^3 q^3} = 48 = aq = 8 \rightarrow a = \frac{8}{q} *$$

$$a + aq + aq^2 \rightarrow a(1 + q + q^2) \xrightarrow{a = \frac{8}{q}} \frac{8}{q}(1 + q + q^2) = 21 \rightarrow 8(1 + q + q^2) = 21q \rightarrow 8 + 8q + 8q^2 = 21q$$

$$8q^2 - 13q + 8 = 0 \rightarrow \Delta = \sqrt{169} = 13 \rightarrow q = \frac{13 \pm 13}{16}$$

$$\begin{cases} q = \frac{1}{2} \\ q = \frac{1}{4} \end{cases}$$

$$x^2 - 2 \geq 2x, x^2 + 4$$

$$(2x)^2 = (x^2 - 2)(x^2 + 4) \rightarrow 4x^2 = x^4 + 4x^2 - 2x^2 - 8 \rightarrow x^4 - 2x^2 - 8$$

$$\xrightarrow{x^2 = y} y^2 - 2y - 8$$

$$\rightarrow (y + 2)(y - 4) \begin{cases} y = 4 \\ y = -2 \end{cases} \rightarrow x^2 = 4 \rightarrow x = \pm 2 \rightarrow x = 2 *$$

$$x^2 - 2 \geq 2x, x^2 + 4 \xrightarrow{x = 2} 2 \geq 4, 1 \rightarrow a_1 = 1, q = \frac{1}{2} \rightarrow S_V = 1 \left(\frac{(\frac{1}{2})^V - 1}{\frac{1}{2} - 1} \right) = \frac{12V}{1}$$

$$1 + q + q^2 + q^3 + q^4 = \frac{121}{11}$$

$$a_1 = 2 \times 10^3$$

$$S_n = ? \rightarrow a_1(1 + q + q^2 + q^3 + q^4) = 243$$

$$d = \frac{94 - 1}{4} = \frac{93}{4} = 23.25 \rightarrow 1, 11, 25, 38, 51, 64, 77, 90, 103, 116, 129, 142, 155, 168, 181, 194, 207, 220, 233, 246, 259, 272, 285, 298, 311, 324, 337, 350, 363, 376, 389, 402, 415, 428, 441, 454, 467, 480, 493, 506, 519, 532, 545, 558, 571, 584, 597, 610, 623, 636, 649, 662, 675, 688, 701, 714, 727, 740, 753, 766, 779, 792, 805, 818, 831, 844, 857, 870, 883, 896, 909, 922, 935, 948, 961, 974, 987, 1000$$

$$q = \left(\frac{94}{1} \right)^{\frac{1}{4}} = 2 \rightarrow 1, 2, 4, 8, 16, 32, 64, 128, 256, 512, 1024$$

$$A + B = 3210 + 1 = 3211$$

$$a_n = -240 - \frac{90}{2}, \dots$$

$$d = \frac{-90}{2} - (-240) = \frac{1}{2} \rightarrow a_{1,1} = -240 + (1 \times \frac{1}{2}) = -239.5$$

$$\rightarrow a_{1,1} = b_1 \rightarrow b_1 = 1 \rightarrow b_n = b_1 q^{n-1} \rightarrow 1 = 1 \times (q^{n-1})$$

$$\rightarrow q^{n-1} = \frac{1}{128} \rightarrow q = \frac{1}{2}$$

$$(a+rd)^r = (a+rd)(a+rd) \rightarrow a^r + rad + r^2 d^2 = a^r + rad + r^2 d^2 \rightarrow rad + r^2 d^2 = rad + r^2 d^2$$

$$\rightarrow rad + r^2 d^2 = 0 \rightarrow rd(a+rd) = 0 \begin{cases} rd=0 \rightarrow d=0 \rightarrow \text{بطل} \\ a+rd=0 \rightarrow d = -\frac{a}{r} = -\frac{1}{r} \end{cases}$$

$$a_r = a + r(-\frac{a}{r}) = \frac{a}{r}$$

$$a_r = a + r(-\frac{a}{r}) = \frac{a}{r} \rightarrow q = \frac{a_r}{a_{r-1}} = \frac{\frac{a}{r}}{\frac{a}{r-1}} = \frac{r-1}{r}$$

$$a_1 = a + 1(-\frac{a}{1}) = \frac{a}{1}$$

$$(a+rd)^r = (a+rd)(a+rd) = a^r + rad + rad + rd^2 = a^r + 2rad + rd^2 \rightarrow rd(2a+d) = 0$$

$$rd(2a+d) = 0 \begin{cases} d=0 \rightarrow \text{بطل} \\ 2a+d=0 \rightarrow d = -2a \end{cases}$$

$$a = \frac{1}{2} \rightarrow d = -\frac{1}{2} \rightarrow a_{10} = (\frac{1}{2})(-\frac{1}{2})^9 = -\frac{1}{2^{10}}$$

$$ra_r = \frac{ra_r + a_r}{r} \rightarrow r(aq^r) = \frac{ra_r + a_r}{r} \rightarrow r^2 q^r = \frac{ra_r + a_r}{r}$$

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$$\rightarrow r^2 q^r = ra_r + a_r \rightarrow q^r - ra_r - a_r = 0 \rightarrow q(q^r - ra_r - a_r) = 0 \begin{cases} q=0 \times \\ q=1 \times \\ q=r \checkmark \end{cases}$$

$$a_n = r \cdot (n-1) \frac{1}{2} \quad a_2 = \frac{a}{2} \quad a_1 = -\frac{1}{2} \quad a_{10} = -1$$

$$(\frac{1}{2} + x)^r = (\frac{a}{2} + x)(-1 + x) = \frac{1}{4} + \frac{1}{2}x - \frac{1}{2}x - x^2 = -\frac{1}{2} + \frac{1}{2}x - x^2$$

$$\frac{1}{4}x + \frac{1}{4} = \frac{1}{2}x - \frac{1}{2} \rightarrow \frac{1}{4}x = -\frac{3}{4} \rightarrow x = -\frac{3}{1}$$

$$\frac{a}{2} - \frac{3}{4} = \frac{-4-3}{4} = -\frac{7}{4} \quad a_1 = \frac{1}{2} - \frac{3}{4} = -\frac{1}{4} \rightarrow q = \frac{-\frac{1}{4}}{-\frac{7}{4}} = \frac{1}{7}$$

$$a_1 + a_2 + a_3 = r^3$$

$$\frac{a + aq^r}{r} = aq^r \xrightarrow{a \neq 0} q^r = \frac{1 + q^r}{r} \rightarrow r^2 q^r = 1 + q^r \rightarrow q^r + r^2 q^r = 0$$

$$\rightarrow (q^r - 1)^r = 0 \rightarrow q^r = 1 \rightarrow a_1(1 + q^r + q^{2r}) = r^3 \rightarrow a_1 = \frac{r^3}{3} \rightarrow q = 0$$