

$$S_n = a_1 \left(\frac{q^n - 1}{q - 1} \right) \Rightarrow S_3 = a_1 \left(\frac{q^3 - 1}{q - 1} \right) = 21$$

$$a_1 q, a_1 q^2, a_1 q^3 = a_1 q^3 \Rightarrow a_1 q^3 = 21 \Rightarrow a_1 = \frac{21}{q}$$

$$\Rightarrow \frac{21}{q} \left(\frac{q^3 - 1}{q - 1} \right) = 21 \Rightarrow \frac{q^3 - 1}{q - 1} = 21 \Rightarrow q^3 - 1 = 21q - 21 \Rightarrow q = \frac{1}{q}$$

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$$b^2 = ac \Rightarrow (2x)^2 = (x^2 - 1)(x^2 + 4) \Rightarrow 4x^2 = x^4 - 1 + 2x^2 \Rightarrow 2x^2 = x^4 - 1 \Rightarrow x^4 - 2x^2 - 1 = 0$$

$$\Rightarrow x = 2 \Rightarrow a_1 = x^2 + 2 = 6, a_2 = 4 \Rightarrow q = \frac{1}{2}$$

$$S_5 = 1 \left(\frac{\left(\frac{1}{2} \right)^5 - 1}{\frac{1}{2} - 1} \right) = 1 \left(\frac{\frac{1}{32} - 1}{-\frac{1}{2}} \right) = 1 \left(\frac{-\frac{31}{32}}{-\frac{1}{2}} \right) = 1 \times \frac{31}{16} = \frac{31}{16}$$

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$$a + aq + aq^2 + aq^3 + aq^4 = a(1 + q + q^2 + q^3 + q^4) = 222 \times \frac{121}{11} = \frac{26622}{11}$$

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$$d = \frac{94 - 1}{a + 1} = \frac{93}{9} = 10 \frac{3}{10} \Rightarrow t_f = a + 3d = 1 + 31 \frac{3}{10} = 32 \frac{3}{10} = A$$

$$q^{n+1} = \frac{b}{a} \Rightarrow q^5 = \frac{94}{1} \Rightarrow q^5 = 94 \Rightarrow q = \sqrt[5]{94} \Rightarrow a_5 = aq^4 = 1 \times \sqrt[5]{94} = B$$

$$\Rightarrow A + B = 32 \frac{3}{10} + 1 = \frac{323}{10}$$

$$32 \frac{3}{10} - 1 = 31 \frac{3}{10}$$

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$$d = \frac{-9\omega + 24}{2 - 1} = -9\omega + 24 = \frac{-9\omega + 96}{2} = \frac{1}{2} = 0 \frac{1}{2} \Rightarrow t_{b1} = a_1 + 100d = -24 + 2\omega = 1$$

$$q^{1-1} = \frac{1}{128} \Rightarrow q^0 = \frac{1}{128} \Rightarrow q = \frac{1}{128} \Rightarrow q = \frac{1}{2^7}$$

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$$\begin{cases} a_r = b_1 \\ a_v = b_r \\ a_q = b_r \end{cases}$$

b_1, b_r, b_q و d را دنبال می‌کنیم.

$$b_r = b_1, b_r \Rightarrow (a+rd)^r = (a+rd)(a+rd) \Rightarrow a^r + r^2 d^r + 1^2 da = a^r + 1^2 d^r + 1^0 da$$

$$\Rightarrow r^0 d + 1^2 da = 0 \Rightarrow 1^0 d + d a = 0 \Rightarrow d(1^0 + a_1) = 0 \Rightarrow \begin{cases} d = 0 \\ 1^0 + a_1 = 0 \Rightarrow a_1 = -1^0 d \Rightarrow d = \begin{bmatrix} a_1 \\ -1^0 \end{bmatrix} \end{cases}$$

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$$\begin{cases} a_r = b_1 \\ a_v = b_r \\ a_n = b^r \end{cases}$$

b_1, b_r, b_q و d را دنبال می‌کنیم.

$$b_r = b_1, b_r \Rightarrow (a+rd)^r = (a+rd)(a+rd) \Rightarrow a^r + r^2 d^r + r^2 da = a^r + r^2 d^r + 1^2 da \Rightarrow r^2 d - r^2 da = 0$$

$$\Rightarrow d^r - da = 0 \Rightarrow d(d-a) = 0 \xrightarrow{d \neq 0 \Rightarrow r^2 d = a} d - a = 0 \Rightarrow d = a$$

$$\frac{b_r}{b_1} = \frac{a+rd}{a+d} = \frac{d+rd}{d+d} = \frac{rd}{rd} = r = q \rightarrow a_1 = \frac{1}{r} \Rightarrow a_b = a q^9 = \frac{1}{r} \times r^9 = r^8 = \boxed{128}$$

$$\begin{matrix} r a q & r a q^r & a q^r \\ \downarrow & \downarrow & \downarrow \\ b_1 & b_r & b_q \end{matrix}$$

b_1, b_r, b_q و d را دنبال می‌کنیم.

$$r b_r = b_1 + b_r \Rightarrow r(r a q^r) = (r a q) + (a q^r) \Rightarrow r a q^r = a q (r + q^r) \Rightarrow r q = r + q^r$$

$$\Rightarrow q^r + r - r q = 0 \Rightarrow q = \boxed{3}$$

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$$d = \frac{V-r}{r-1} = \frac{V}{r} - r = -\frac{1}{r} = -0.125$$

$$t_f = a_1 + r d = r - 0.125 = 1.125$$

$$t_n = a_1 + v d = r - 1.125 = 0.125$$

$$t_{1,r} = a_1 + r d = r - r = -1$$

$$1.125 + x, 0.125 + x, -1 + x \rightarrow b^r = ac \Rightarrow \left(\frac{1}{r} + x\right)^r = \left(\frac{a}{r} + x\right)(-1 + x) \Rightarrow \frac{1}{19} + x^r + \frac{x}{r} = -\frac{a}{r} + x^r + \frac{1}{r} x \Rightarrow \frac{1}{19} + \frac{x}{r} = -\frac{a}{r} + \frac{1}{r} x \Rightarrow \frac{x}{r} = -\frac{r}{19} - \frac{1}{19} = -\frac{r+1}{19} \Rightarrow x = \frac{-r-1}{r} = 0.125$$

$$\begin{matrix} a + a q^r + a q^s = V r \\ \downarrow \quad \downarrow \quad \downarrow \\ t_1 \quad t_r \quad t_s \end{matrix}$$

$$\Rightarrow a + a + d + a + r d = V r \Rightarrow r a + 1^0 d = V r \Rightarrow a = 1, d = \boxed{V}$$

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معی توانباشند $d=0$ $a = \frac{Vr}{r}$ $d=1$

$$a q^r - a = d \rightarrow \frac{Vr}{r} - \frac{Vr}{r} = 0$$