

$$q = 2$$

$$t_{10} = t_1 \times q^9 = \frac{1}{2} \times 2^9 = 2^8 \quad \text{الف (1)}$$

عارف سعادت نیا

$$a_1 = \frac{1}{2} \times 2^0 = \frac{1}{2} \quad a_{10} = \frac{1}{2} \times 2^9 = 2^8$$

$$\frac{t_1 q^{10}}{t_1 q^0} = \frac{\frac{1}{2} \times 2^{10}}{\frac{1}{2} \times 2^0} = 2^9 = 128$$

$$\sqrt{2 \times 2^8} = \sqrt{1024} = 32 \rightarrow \text{است حدیثی}$$

$$\frac{1}{2} \times q^{n-1} = 128 \quad q^{n-1} = 128 \times 2 = 256 \rightarrow 2^8 = 256 \rightarrow n = 9$$

$$\frac{a_1}{q^r} \times \frac{a_r}{q} \times a_2 \times a_3 \times a_4 \times a_5 \times a_6 \times a_7 \times a_8 \times a_9 = 2^8 \quad \text{الف (3)}$$

$$a_2 = 2, a_3 = 4, a_4 = 8, a_5 = 16, a_6 = 32, a_7 = 64, a_8 = 128, a_9 = 256$$

$$\frac{t_1}{t_0} = q^r = 2^r = 128 \quad \text{ب (2)}$$

$$t_{10} = t_1 \times q^9 = \frac{1}{2} \times 2^9 = 2^8 = 256$$

$$a_1 \times a_{10} = \frac{a_1}{q^r} \times a_{10} q^r = 2^8 = 2 \times 64 = 128$$

$$\frac{a_1}{a_r} = \frac{a_{11}}{a_v} \quad \frac{x}{1-x} = \frac{x+1}{x} \quad x^r = (1-x)(x+1) \quad \text{ج (4)}$$

$$r \sqrt{x} = 2^a \times 2^b \quad a+b = 0 \quad \text{د (5)}$$

$$2^a \sqrt{x} = 2^a \times 2^b \quad \frac{a+b}{2} = \frac{0}{2} = 0$$

$$x^r = -x^r + 1 \quad 2x^r = 1 \quad x^r = \frac{1}{2} \rightarrow x = \pm \frac{1}{\sqrt{2}}$$

$$a_1 + a_2 + a_3 = 12 \quad a_1 \times a_2 \times a_3 = 12$$

$$\frac{a_1}{r} + a_2 + a_3 = 12 \quad \frac{a_1}{r} \times a_2 \times a_3 = 12$$

$$\frac{1}{r} + 2 + 2 = 12 \quad a_1 = 3 \quad a_2 = 3 \quad a_3 = 3$$

$$a_1 + a_1 q^r = 12 \quad a_1 q + a_1 q^r = 12$$

$$a_1(1+q^r) = 12 \quad a_1(q+q^r) = 12$$

$$3+3q^r = 12 \quad q^r = 3 \quad q = 3$$

$$a_1 = 1 \quad a_2 = 3 \quad a_3 = 9 \quad a_4 = 27$$

$$r < \frac{1}{r} \quad 1, 3, 9, \dots \quad 9, 3, 1, \dots$$

$$a q - a = a(q-1) \quad a(q^r - a) = a(q(q-1))$$

$$a q^r - a q = a q(q-1) \quad a q^r - a q^r = a q^r(q-1)$$

$$a(q-1) [1, q, q^2, \dots] \quad \text{نشان می دهد}$$

$$s_{10} = \frac{1}{2} \times \left[\frac{2^{10} - 1}{2 - 1} \right] = 1023 \quad \text{ه (6)}$$

$$2^{10} \times 2^{\frac{n(n-1)}{2}} = 2^{10} \times 2^5 = 2^{15}$$

$$S_n = a + aq + aq^2 + \dots + aq^{n-1} \quad \times q$$

$$qS_n = aq + aq^2 + aq^3 + \dots + aq^n$$

$$qS_n - S_n = aq^n - a = S_n(q-1) = a(q^n - 1)$$

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

$$S_n = a_1 + a_2 + a_3 + \dots + a_n \quad \text{الف (10)}$$

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

$$2S_n = (a_1 + a_n) + (a_2 + a_{n-1}) + \dots + (a_n + a_1)$$

$$S_n = \frac{n}{2} (a_1 + a_n) \rightarrow a_n = a_1 + (n-1)d$$

$$S_n = \frac{n}{2} (2a_1 + (n-1)d)$$