

$$r=2$$

$$\text{الف) } t_n = r^n \times \frac{1}{r} \quad t_{10} = 2^{10} \times \frac{1}{2} = 2^9 = 512$$

$$\text{ب) } t_n = r^{n-2} \quad \frac{2^{12}}{2^{10}} = 2^2 = 4$$

$$\text{ج) } \sqrt{2^2 \times 2^4} = 2^3 = 8$$

$$\text{د) } 128 = 2^7 = 2^{9-2} \Rightarrow \text{این جمله}$$

$$\frac{t_{m+1}}{t_m} = \frac{t_m}{t_n} = \frac{96}{12} = r^2 \Rightarrow r=2$$

$$t_{10} = t_1 \times r^9 = 96 \times 2^9 = 12288$$

$$a_1 \times a_2 \times a_3 \times a_4 \times a_5 = a_7^5 \Rightarrow a_7 = \sqrt[5]{2^2 \times 2^4 \times 2^6 \times 2^8 \times 2^{10}} \Rightarrow a_7 = 2^4$$

$$a_1 \times a_5 = a_3 \times a_3 = 2^4 \times 2^4 = 16$$

$$r\sqrt{r} = 2^2 \times 2^{\frac{1}{2}} = 2^{\frac{5}{2}}$$

$$2^a \times 2^{\frac{a}{2}} \times 2^b = \left(2^{\frac{5}{2}}\right)^r \Rightarrow b+a=0$$

$$\frac{b+a}{r} = 2/0$$

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

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

$$\frac{a_1(1+r^3)}{a_1r(1+r)} = \frac{(1+r)(r^3-r+1)}{r(1+r)} = \frac{r^4}{r^2} \quad 2Ar = 12r^3 - 12r + 12$$

$$12r^3 - 12r + 12 = 0 \quad 3r^3 - 10r + 3 = 0 \quad \Delta = 100 - 36 = 64 \quad \sqrt{\Delta} = 8$$

$$r_1 = \frac{10 \pm 8}{6} \Rightarrow \begin{cases} r_1 = 3 \\ r_2 = \frac{1}{3} \end{cases}$$

$$a_1(1+r^3) = 2A \Rightarrow \begin{cases} a_1 = 1 \\ a_2 = 27 \end{cases}$$

در هر دو حالت بزرگترین عدد ۲۷ است

$$a_2 = \sqrt[3]{27} = 3$$

$$\frac{r}{r} + r + 3r = 13 \Rightarrow r(r + \frac{1}{r}) = 10 \Rightarrow r + \frac{1}{r} = \frac{10}{r} = 3 + \frac{1}{r}$$

$$r = 3$$

$$a_1 = \frac{r}{r} = 1 \quad a_2 = 3 \quad a_3 = 3 \times 3 = 9$$

$$\text{الف) } a\left(\frac{q^{10}-1}{q-1}\right) = r\left(\frac{r^{10}-1}{r-1}\right) = 3^{10}-1$$

$$\text{ب) } a_1 \times a_2 \times a_3 \times \dots \times a_9 = a^{10} \times r^{45} = 3^{10} \times 3^{45}$$

$$a, aq, aq^2, aq^3, \dots$$

$$a(q-1), aq(q-1), aq^2(q-1), \dots$$

$$\frac{aq^2(q-1)}{a(q-1)} = q^2 \rightarrow \text{مقدور مطلق}$$

الف)

$$a, a+d, a+2d, \dots, a+(n-1)d$$

$$a + a + (n-1)d = a + d + a + (n-2)d = \dots$$

$$2a + (n-1)d \quad \dots \text{حالات اول و آخر، دوم و یکم مانند بزرگتر و کوچکتر}$$

$$\frac{n}{2}(2a + (n-1)d)$$

جمع کلیاتی دارند و تعداد آنها $\frac{n}{2}$ است پس:

$$a, aq, aq^2, aq^3, aq^4, \dots, aq^{n-1}$$

سوال ۱۰ تست ب:

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

$$S_n q = aq + aq^2 + \dots + aq^n$$

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