

نام و نام خانوادگی شماره کلاس 13

$$r_n = \frac{1}{x}, 1, 2, \dots \Rightarrow C_n = \frac{1}{x} \times x^{n-1}$$

$$a_{10} = 204 \Rightarrow \sqrt[10]{204} = 2 \quad \text{الف}$$

$$a_{10} = \frac{1}{x} \times x^9 = x^8 = 204 \quad \text{الف}$$

$$\frac{1}{x} \times x^{n-1} = 121 = x^{n-1} = 204 \Rightarrow n=9 \quad \text{ب}$$

$$\frac{a_{14}}{a_{12}} = x^2 = 14 \quad \text{ب}$$

$$\frac{a_{14}}{a_{12}} = x^2 \Rightarrow \frac{94}{14} = x^2 \Rightarrow x = 2 \quad \text{الف}$$

$$\Rightarrow C_{10} = C_n \times x^9 = 94 \times 2 = 188 \quad \text{ب}$$

$$a_1 \times a_4 \times a_5 \times a_6 \times a_9 = 128 \quad (a_1 \times a_9) (a_4 \times a_5) \cdot a_6$$

$$\Rightarrow a_1 \times (a_6^2) \times (a_6^2) = 128 \Rightarrow a_6 = 2 \quad \text{الف}$$

$$a_1 \times a_9 = a_6^2 = 4 \quad \text{ب}$$

$$x^a \leq \sqrt{x^b}$$

$$x^a = x^{\frac{a}{2}} \Rightarrow x^{a+b} = x^a \quad \text{الف}$$

$$\Rightarrow x^{a+b} = x^a \Rightarrow a+b=a \Rightarrow \frac{a+b}{x} = \frac{a}{x} = 1 \quad \text{ب}$$

$$x^y = (x+1)(1-x) = x - x^y + 1 - x = 1 - x^y$$

$$x^y = 1 - x^y \Rightarrow 2x^y = 1 \Rightarrow x^y = \frac{1}{2} \Rightarrow x = \pm \sqrt[2]{\frac{1}{2}}$$

فقط مقدار + قابل است زیرا به ازای $x = -\sqrt[2]{\frac{1}{2}}$ جمله فرد غیر صحیح است

$$a + aq^p = 41 \quad a(1+q^p) = 41 \quad \frac{1+q^p}{q(1+q)} = \frac{1}{2} \Rightarrow \frac{(1+q)(1-q+q^p)}{q(1+q)} = \frac{1}{2}$$

$$aq + aq^p = 12 \quad aq(1+q) = 12 \quad \text{②} \quad q(1+q)$$

$$\Rightarrow 2q = 1 - q + q^p \Rightarrow 3q - 1 + q^p = 0 \Rightarrow 3q - 1 + q^p = 0 \Rightarrow (q-1)(q-9)$$

$$\Rightarrow \begin{cases} \frac{1}{3} & \Rightarrow a + a \cdot \frac{1}{3} = 41 \Rightarrow a = 31 \\ 9 & \Rightarrow a + \frac{1}{9}a = 41 \Rightarrow a = 37 \end{cases} \Rightarrow 19, 2, 9, 27 \Rightarrow 27, 9, 2, 1 \Rightarrow \underline{27}$$

$$\frac{2A}{q} \quad x \quad aq \quad \Rightarrow x^2 = 2v \quad n = 2$$

$$\frac{v + vq^p}{q} = 10 \Rightarrow 10q = v + vq^p \Rightarrow q = 2 \quad \text{②}$$

$$19, 2, 9, 27 \quad 27, 9, 2, 1$$

$$\text{الف) } S_{10} = 4 \left(\frac{4^{10} - 1}{4 - 1} \right) = 4 \times \frac{4^{10} - 1}{3} = \frac{4^{10} - 1}{3}$$

$$\text{ب) } E_{10} = 4 \times 2^9 \Rightarrow P_{10} = \sqrt[10]{4 \times 2^9 \times 4^9} = (4 \times 2^9)^{10}$$

$$\text{②}$$

$$a, aq, aq^p, aq^p \Rightarrow a - aq \Rightarrow aq - aq^p, aq^p - aq^p$$

$$\frac{aq - aq^p}{a - aq} = \frac{aq^p - aq^p}{aq - aq^p} \Rightarrow \frac{aq(1-q)}{a(1-q)} = \frac{aq^p(1-q)}{aq(1-q)}$$

$$\Rightarrow q = q \Rightarrow \text{مساوية} \Rightarrow \text{مساوية} \Rightarrow \text{مساوية} \quad \text{②}$$

$$\text{الف) } \text{المتوسط الحسابي} = \frac{a_1 + a_2 + \dots + a_n}{n} \Rightarrow S_n = \frac{a_1 + a_2 + \dots + a_n}{n} \times n$$

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

$$\text{ب) } a_1 q^{n-1} + a_1 q^{n-2} + \dots + a_1 q + a_1 = S_n \times q \Rightarrow a_1 q^n + a_1 q^{n-1} + \dots + a_1 q^2 + a_1 q = q S_n$$

$$\Rightarrow a_1 q^n + S_n - a_1 = q S_n \Rightarrow S_n(q-1) = a_1(q^n - 1)$$

$$\Rightarrow S_n = \frac{a_1(q^n - 1)}{q - 1}$$