

کتاب دوم در ریاضیات

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$$a_n = \frac{1}{p} a_{n-1}, \dots$$

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

$$p^{n-1} \Rightarrow p = \boxed{14}$$

الف) جابجایی در معادله:

$$\frac{p}{p^n} = p^{\frac{1}{n}} = \boxed{14} \leftarrow \frac{a_{11}}{a_{1p}}$$

$$q^{\frac{n-1}{p}} = \frac{b}{a} \Rightarrow p^{\frac{n-1}{p}} = \frac{14}{p} \Rightarrow p^{\frac{n-1}{p}} = 14 \Rightarrow \boxed{p=14}$$

$$p^{\frac{n-1}{p}} = 14 \Rightarrow p = 14 \Rightarrow \boxed{n=9}$$

$$a q^f = 14$$

$$a q^v = 94$$

$$a q^f = 14 \Rightarrow 14a = 14 \Rightarrow a = \frac{14}{f}$$

$$q^f = 1 \Rightarrow q = p$$

$$\frac{p}{f} \times p^{\frac{1}{f}} = \frac{14}{f} \Rightarrow \boxed{p=14}$$

$$a_1 \times a_p \times a_{p^2} \times a_{p^3} \times a_{p^4} = p^k$$

$$a_p = p^k \Rightarrow a_p = p^k = a_{p^k} \text{ (الف) (۲)}$$

$$a_1 \times a_d = a_p \times a_q \Rightarrow a_1 \times a_d = \boxed{9} = a_1 \times a_d \text{ (ب) (۳)}$$

$$(ESP)^p = p^a p^b \Rightarrow p^p = p^{a+b} \quad a+b=d$$

$$\frac{a}{p} = \frac{a+b}{p}$$

$$a_p = 1-x \quad a_v = x \quad a_n = x+1 \quad x^p = (1-x)(x+1) \Rightarrow \boxed{x^p = 1-x^p}$$

$$\frac{a_v}{a_p} = q^{\frac{v-p}{p}} = \boxed{q^f}$$

$$\frac{a_{11}}{a_v} = q^{1-v} = \boxed{q^f}$$

$$\frac{x}{1-x} = \frac{x+1}{x}$$

$$x^p = 1$$

$$x^p = \frac{1}{p}$$

$$x = \pm \frac{1}{\sqrt{p}}$$

$$\frac{1}{\sqrt{p}} = \frac{1}{\sqrt{14}}$$

$$a + q^p = 14 \quad a q + a q^p = 14$$

$$p - 14 + p q^p = 14 \quad p q^p - 14 q + p = 0 \quad q = \frac{10 \pm 1}{4} \quad q = p$$

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

$$1, p, q, \boxed{p}$$

$$a = \frac{14}{p} = 1 \leftarrow q = p$$

$$\boxed{p}, q, p, 1$$

$$a = \frac{14}{p} = 14 \leftarrow q = \frac{1}{p}$$

$$a + aq + aq^2 = 14 \quad a(1 + q + q^2) = 14 \quad \frac{14}{q} (1 + q + q^2) = 14 \quad 14(1 + q + q^2) = 14q \quad (V)$$

$$a + aq + aq^2 = 14 \quad aq^2 = 14 \quad (aq)^2 = 14 \rightarrow aq = \sqrt{14} \quad a = \frac{\sqrt{14}}{q} \quad 14 + 14q + 14q^2 = 14q$$

$$14q^2 - 14q + 14 = 0 \quad \Delta = (-14)^2 - 4 \cdot 14 \cdot 14 = 196 - 784 = -588 \quad q_1 = 1$$

$$aq = \sqrt{14} \quad q = \sqrt{14} \rightarrow a = 1 \quad \boxed{1, \sqrt{14}, q} \quad q_2 = \frac{1}{\sqrt{14}}$$

$$q = \frac{1}{\sqrt{14}} \rightarrow a = 9 \quad \boxed{9, \frac{1}{\sqrt{14}}, 1}$$

$$a_n = 1, 4, 16, \dots$$

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

$$\frac{1}{1} \left(\frac{1^{10} - 1}{1 - 1} \right) = 1^{10} - 1 = 0 \quad \text{الف) مجموع 10 عدد اول} \quad (V)$$

$$1 + 4 + 16 + \dots + q$$

$$\frac{10 \times 4}{4} = 10 \quad \text{ب) 10 عدد اول}$$

$$a \times aq \times aq^2 \times \dots \times aq^{n-1} = a^n \times \boxed{1 \times 1 \times \dots \times 1}$$

ب) 10 عدد اول

$$a_n = aq^{(n-1)} \quad d_n = a_{n+1} - a_n \quad d_n = aq^n - aq^{n-1} = aq^{n-1}(q-1) = a(q-1)q^{n-1}$$

$$a(q-1) \leftarrow \text{نسبت دو به هم در یک جمله اول}$$

$$a_1 + a_2 + a_3 + \dots + a_n$$

$$a + (a+d) + (a+2d) + \dots + a_n$$

$$\text{الف) مجموع 10 جمله اول در حساب حسابی} \quad (10)$$

$$(a + a + a + \dots + a) + (0 + d + 2d + \dots + d_n)$$

$$d(0 + 1 + 2 + \dots + (n-1)) \Rightarrow \frac{n(n-1)}{2} \times d + an = S_n$$

$$S_n = \frac{n}{2} [2a + (n-1)d]$$

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

ب) مجموع 10 جمله اول در حساب هندسی

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

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

$$S_n - S_n = (a + aq + aq^2 + \dots + aq^{(n-1)}) - (aq + aq^2 + \dots + aq^n) \Rightarrow S_n(1-q) = a(1-q^n)$$