

$$(11 + 21 + 31 + \dots + 241)(21 + 41 + 61 + \dots + 241) =$$

(1)

$$(1+4)(2+24)$$

$$7 \times 24 = 168$$

از آن به جدول 2 و 2 داریم عدد سافتی می شود.
پس ما قبل آن را حساب می کنیم.

اولین رقم غیر صفر است راست (2) می شود.

$$\frac{1+\sqrt{5}}{\sqrt{4+\sqrt{5}}} \xrightarrow{\text{م توان 2}} \frac{1+\sqrt{5}}{\sqrt{4+\sqrt{5}}} \xrightarrow{\text{م توان 2}} \frac{1+\sqrt{5}+2\sqrt{5}}{4+\sqrt{5}} \rightarrow \frac{1+2\sqrt{5}}{4+\sqrt{5}} \rightarrow \frac{2(4+\sqrt{5})}{(4+\sqrt{5})} = 2 \rightarrow \boxed{2}$$

(2)

$$\left[\frac{\sqrt{2}+\sqrt{5}}{\sqrt{5}+\sqrt{2}} \times (\sqrt{3}-\sqrt{5} - \sqrt{3}+\sqrt{5}) \right]^2 \rightarrow \sqrt{4} = 2$$

$$\frac{2+5+2\sqrt{10}}{10+2+2\sqrt{10}} \times \left[3-\sqrt{5} + 3+\sqrt{5} - 2(\sqrt{9+2\sqrt{5}} - \sqrt{5}-5) \right] =$$

$$\frac{7+2\sqrt{10}}{12+2\sqrt{5}} \times (4-4) \rightarrow \frac{7+2\sqrt{10}}{2(4+\sqrt{5})} \times 4 \rightarrow \frac{7+2\sqrt{10}}{(\sqrt{5}+1)^2} \Rightarrow \boxed{\frac{7+2\sqrt{10}}{\sqrt{5}+1}}$$

$$\frac{\sqrt{5}+\sqrt{2}}{5-\sqrt{4}} - \frac{2}{4\sqrt{9}-1} \rightarrow (\sqrt{2}+\sqrt{3}) - (\sqrt{2}+1) = \sqrt{2}-1$$

(3)

$$\frac{2\sqrt{2}+4\sqrt{5}}{5-\sqrt{2}} \xrightarrow{(5+\sqrt{2})} \frac{10\sqrt{2}+20\sqrt{10}+20\sqrt{5}+10}{19} = \sqrt{2}+\sqrt{5}$$

(1)

$$\frac{2(\sqrt{2}+1)}{\sqrt{3}-1(\sqrt{2}+1)} \rightarrow \frac{2\sqrt{2}+2}{2} \rightarrow \sqrt{2}+1$$

(2)

$$\frac{2\sqrt{2}-1}{4+\sqrt{3}} + \frac{1}{2-\sqrt{3}} \rightarrow \sqrt{2}-1 + 2+\sqrt{3} = \boxed{1+2\sqrt{3}}$$

$$\frac{(3\sqrt{2}-1)(4-\sqrt{5})}{(4+\sqrt{2})(4-\sqrt{5})} \rightarrow \frac{12\sqrt{2}+5\sqrt{4}-9-4}{13} = \frac{12\sqrt{2}-14}{13} = \sqrt{2}-1$$

(1)

$$\frac{1}{2-\sqrt{3}} \xrightarrow{(2+\sqrt{3})} \frac{2+\sqrt{3}}{1}$$

(2)

Arman

الف) $\frac{\sqrt{1+\sqrt{3}} + \sqrt{\sqrt{3}-1}}{\sqrt{3}-\sqrt{2}} - 2 + 4+2\sqrt{4}$ (6)

$$\frac{(\sqrt{3}+\sqrt{2})}{(\sqrt{3}-\sqrt{2})} \times \frac{\sqrt{1+\sqrt{3}} + \sqrt{\sqrt{3}-1}}{\sqrt{3}-\sqrt{2}} - 2 \xrightarrow{(\sqrt{3}+\sqrt{2})} \frac{\sqrt{1+\sqrt{3}} + \sqrt{\sqrt{3}-1}}{1} + \frac{4+2\sqrt{4} - \sqrt{3} - \sqrt{2}}{1} - 2 \rightarrow 4+2\sqrt{4}$$

ب) $\sqrt[4]{12} \times \sqrt[4]{144} \times \sqrt[4]{45} =$

$$2^{\frac{1}{4}} \times 3^{\frac{1}{4}} \times 2^{\frac{1}{4}} \times 2^{\frac{1}{4}} \times 3^{\frac{1}{4}} = 3^{\frac{1}{4}} \times 2^{\frac{5}{4}} = \boxed{12}$$

$$\frac{2^n (1+2+2^2+2^3+2^4+2^5)}{2^{n-2} (1+2^1+2^2+2^3+2^4+2^5)} = \frac{2^n \times 2^6}{2^{n-2} \times 4^6} = 16 \times 16$$

$$\boxed{16 = 16 \times 16} \quad 2^n \times 16 = 2^{n-2} \times 4^6 \Rightarrow \boxed{n=2}$$

ا: $\sqrt[4]{4-2}$ } $ab = \sqrt[4]{4-4} = \sqrt[4]{0} = 0$ (7)

ب: $\sqrt[4]{4+2}$

ا: $\sqrt[4]{4-2}$ } $a^2+b^2 = a \quad [(n-rab)(n+rab)]^r \rightarrow$

ب: $\sqrt[4]{4+2}$

$$\sqrt{4-2} + \sqrt{4+2} + 2\sqrt{2} = 2\sqrt{2} \quad \boxed{t=14}$$

$$(2\sqrt{2} - 2\sqrt{2})^t = t(2-5\sqrt{2}) \Rightarrow 2^t + 1 - 14\sqrt{2} = 2^t - 14\sqrt{2} = 14(2-5\sqrt{2})$$

$$\left(a + \frac{1}{a} + \sqrt{2}\right)^t \left(a + \frac{1}{a} - \sqrt{2}\right)^t = 2^t$$

$$a = \sqrt{2-5\sqrt{2}} \rightarrow \sqrt[4]{(2-5\sqrt{2})}^t$$

$$\left[\left(a + \frac{1}{a} + \sqrt{2}\right) \left(a + \frac{1}{a} - \sqrt{2}\right)\right]^t \xrightarrow{\text{مضروب}} a^2 + \frac{1}{a^2} + \cancel{2\sqrt{2}} = 2^t$$

$$a^2 + \frac{1}{a^2} \rightarrow (2-5\sqrt{2}) + \frac{1}{(2-5\sqrt{2})(2+5\sqrt{2})} \rightarrow 2 - \sqrt{2} + 2 + \sqrt{2} = 2^t$$

$$2 = 2^t \quad \boxed{t=1}$$

Arman

$$A = \sqrt[3]{x} \sqrt[3]{14} \times \left(\frac{1}{2}\right)^{-\frac{1}{3}} \rightarrow$$

$$5 \quad x^{\frac{1}{3}} \times x^{\frac{1}{3}} \times x^{\frac{1}{3}} \rightarrow x^{\frac{1}{3} + \frac{1}{3} + \frac{1}{3}} = x^1$$

$$(2A)^{-\frac{1}{3}} = \frac{1}{(2A)^{\frac{1}{3}}} \rightarrow \frac{1}{(2^{\frac{1}{3}})^{\frac{1}{3}}} = \boxed{\frac{1}{2}}$$

$$10 \quad \sqrt[3]{a} = x^{\frac{1}{3}} \times a^{\frac{1}{3}} \rightarrow a^{\frac{1}{3}} = x^{\frac{1}{3}} \times a^{\frac{1}{3}}$$

$$\frac{1}{x^{\frac{1}{3}}} = a^{\frac{1}{3} - \frac{1}{3}} \rightarrow a^0 = \frac{1}{x^{\frac{1}{3}}} \rightarrow \boxed{a = \frac{1}{\sqrt[3]{x}}}$$

$$15 \quad \frac{\frac{1}{a} - 3}{1 + \sqrt{3}} = \frac{\sqrt[3]{3} - 3}{1 + \sqrt{3}} \cdot \frac{(1 - \sqrt{3})}{(1 - \sqrt{3})} = \frac{\sqrt[3]{3} - 9 - 3 + \sqrt{3}}{1 - 3} = \frac{\sqrt[3]{3} - 12 + \sqrt{3}}{-2}$$

$$\boxed{-\frac{\sqrt[3]{3} + 4}{2}}$$

$$\sqrt{9+a} - \sqrt{9-a} = 2$$

$$20 \quad (\sqrt{9+a} + \sqrt{9-a}) \times (\sqrt{9+a} - \sqrt{9-a}) = 9+a - 9-a = -2$$

$$\frac{9+a}{2} = \boxed{\frac{a}{2}}$$