

$$\underbrace{(11+21+31+\dots+201)}_{\text{کلاس ۱}} \underbrace{(21+31+41+\dots+191)}_{\text{کلاس ۲}} \Rightarrow 9 \times 7 = 63$$

کلاس ۱۲ است

$$\int \sqrt{4+\sqrt{v}} \cdot \sqrt{1+\sqrt{v}} \Rightarrow \int \sqrt{4+\sqrt{v}} \cdot \sqrt{1+\sqrt{v}}^2 = \int \frac{1+2\sqrt{v}+v}{4+\sqrt{v}} = \int \frac{2(4+\sqrt{v})}{4+\sqrt{v}} = \int 2 = 2\sqrt{v} + C$$

$\sqrt{1+\sqrt{v}} \Rightarrow \sqrt{(1+\sqrt{v})^2}$

$\sqrt{v} - \sqrt{v} + \sqrt{v} = 0$

$$\text{ب) } \left(\frac{\sqrt{3}+\sqrt{5}}{\sqrt{10}+2} \right) \left(\frac{\sqrt{3}\sqrt{5}-\sqrt{3}+\sqrt{5}}{\sqrt{3}\sqrt{5}-\sqrt{3}\sqrt{5}} \right) = \frac{\sqrt{3}+\sqrt{5}}{\sqrt{10}+2} \times 0 = 0$$

$$\text{الف) } \frac{\sqrt{11}+\sqrt{27}}{2-\sqrt{4}} - 2(\sqrt{9}-1)^{-1} \Rightarrow \frac{(\sqrt{11}+\sqrt{27})(2+\sqrt{4})}{2-\sqrt{4}} \Rightarrow \frac{2\sqrt{11}+2\sqrt{27}+2\sqrt{11}+2\sqrt{27}}{2-\sqrt{4}} = \frac{4\sqrt{11}+4\sqrt{27}}{2-\sqrt{4}}$$

$\sqrt{27} = 3\sqrt{3}$

$$\text{ب) } \frac{\sqrt{3}-1}{4+\sqrt{3}} + (2-\sqrt{3})^{-1} \Rightarrow \frac{(\sqrt{3}-1)(2+\sqrt{3})}{4+\sqrt{3}} + (2-\sqrt{3})^{-1} = \frac{2\sqrt{3}-1-2+\sqrt{3}}{4+\sqrt{3}} + \frac{2+\sqrt{3}}{2-\sqrt{3}} = \frac{3\sqrt{3}-3}{4+\sqrt{3}} + \frac{2+\sqrt{3}}{2-\sqrt{3}}$$

$4\sqrt{3}-10+9-2\sqrt{3} = 2\sqrt{3}-1$

$$\text{الف) } \frac{\sqrt{1+\sqrt{3}}+\sqrt{\sqrt{3}-1}}{\sqrt{\sqrt{3}-\sqrt{3}}} - 2 = \frac{(\sqrt{1+\sqrt{3}}-\sqrt{\sqrt{3}-1})}{\sqrt{\sqrt{3}-\sqrt{3}}} + 2 \frac{(\sqrt{1+\sqrt{3}}+\sqrt{\sqrt{3}-1})}{(\sqrt{3}-\sqrt{3})(\sqrt{3}-\sqrt{3})} = 2 \frac{(\sqrt{1+\sqrt{3}}+\sqrt{\sqrt{3}-1})}{(\sqrt{3}-\sqrt{3})} = \frac{2(\sqrt{1+\sqrt{3}}+\sqrt{\sqrt{3}-1})}{(\sqrt{3}-\sqrt{3})}$$

همان صورتی که در فرکانس به هم می‌زنیم

$$\text{ب) } \sqrt[4]{3} \times \sqrt[4]{12} \times \sqrt[4]{63} = 3^{\frac{1}{4}} \times 2^{\frac{1}{4}} \times 3^{\frac{1}{4}} \times 2^{\frac{1}{4}} \times 3^{\frac{1}{4}} \times 7^{\frac{1}{4}} = 2^{\frac{2}{4}} \times 3^{\frac{3}{4}} \times 7^{\frac{1}{4}} = 2^{\frac{1}{2}} \times 3^{\frac{3}{4}} \times 7^{\frac{1}{4}}$$

$2^{\frac{1}{2}} \times 3^{\frac{3}{4}} \times 7^{\frac{1}{4}} = 2\sqrt{3} \times 7^{\frac{1}{4}}$

$$\frac{r^{21} + r^{21+1} + r^{21+2} + r^{21+3} + r^{21+4} + r^{21+5}}{r^{21-1} + r^{21-2} + r^{21-3} + r^{21-4} + r^{21-5}} = \frac{r^{21}(1+r+r^2+r^3+r^4+r^5)}{r^{21}(r^{-1}+r^{-2}+r^{-3}+r^{-4}+r^{-5})} = \frac{1+r+r^2+r^3+r^4+r^5}{r^{-1}+r^{-2}+r^{-3}+r^{-4}+r^{-5}}$$

$\frac{r}{1} + 10$

$$\frac{r^{21}(\frac{1}{r})}{r^{21}(\frac{1}{r})} = 10 \Rightarrow \frac{1}{r} \times \frac{r}{1} \times r^{21} = r^{21} \Rightarrow \frac{1}{r} \times r^{21} = r^{20} \Rightarrow \frac{1}{r} \times r^{20} = r^{19} \Rightarrow \frac{1}{r} \times r^{19} = r^{18} \Rightarrow \frac{1}{r} \times r^{18} = r^{17} \Rightarrow \frac{1}{r} \times r^{17} = r^{16} \Rightarrow \frac{1}{r} \times r^{16} = r^{15} \Rightarrow \frac{1}{r} \times r^{15} = r^{14} \Rightarrow \frac{1}{r} \times r^{14} = r^{13} \Rightarrow \frac{1}{r} \times r^{13} = r^{12} \Rightarrow \frac{1}{r} \times r^{12} = r^{11} \Rightarrow \frac{1}{r} \times r^{11} = r^{10} \Rightarrow \frac{1}{r} \times r^{10} = r^9 \Rightarrow \frac{1}{r} \times r^9 = r^8 \Rightarrow \frac{1}{r} \times r^8 = r^7 \Rightarrow \frac{1}{r} \times r^7 = r^6 \Rightarrow \frac{1}{r} \times r^6 = r^5 \Rightarrow \frac{1}{r} \times r^5 = r^4 \Rightarrow \frac{1}{r} \times r^4 = r^3 \Rightarrow \frac{1}{r} \times r^3 = r^2 \Rightarrow \frac{1}{r} \times r^2 = r \Rightarrow \frac{1}{r} \times r = 1 \Rightarrow 1 = 1$$

$\frac{1}{r} \times r^{19} = r^{18} \Rightarrow \frac{1}{r} \times r^{18} = r^{17} \Rightarrow \frac{1}{r} \times r^{17} = r^{16} \Rightarrow \frac{1}{r} \times r^{16} = r^{15} \Rightarrow \frac{1}{r} \times r^{15} = r^{14} \Rightarrow \frac{1}{r} \times r^{14} = r^{13} \Rightarrow \frac{1}{r} \times r^{13} = r^{12} \Rightarrow \frac{1}{r} \times r^{12} = r^{11} \Rightarrow \frac{1}{r} \times r^{11} = r^{10} \Rightarrow \frac{1}{r} \times r^{10} = r^9 \Rightarrow \frac{1}{r} \times r^9 = r^8 \Rightarrow \frac{1}{r} \times r^8 = r^7 \Rightarrow \frac{1}{r} \times r^7 = r^6 \Rightarrow \frac{1}{r} \times r^6 = r^5 \Rightarrow \frac{1}{r} \times r^5 = r^4 \Rightarrow \frac{1}{r} \times r^4 = r^3 \Rightarrow \frac{1}{r} \times r^3 = r^2 \Rightarrow \frac{1}{r} \times r^2 = r \Rightarrow \frac{1}{r} \times r = 1 \Rightarrow 1 = 1$

Subject:

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$$a = \sqrt[4]{\sqrt{4-r}}$$

$$b = \sqrt[4]{\sqrt{4+r}}$$

$$(a^r + b^r - tab)(a^r + b^r + tab)^r = t(r\sqrt{r})$$

$$(a-b)^r(a+b)^r = (a^r - b^r)^r = (\sqrt[4]{\sqrt{4-r}} - \sqrt[4]{\sqrt{4+r}})^r = \sqrt{4-r} - \sqrt{4+r} = (r\sqrt{4-r})^r$$

$$r\sqrt{4-r} = t(r\sqrt{r}) \rightarrow t = \frac{r\sqrt{4-r}}{r\sqrt{r}} = \sqrt{\frac{4-r}{r}} = \boxed{14}$$

$$\frac{r\sqrt{4-r}}{r\sqrt{r}} = 1$$

$$a = \sqrt[4]{\sqrt{r} \cdot \sqrt{r}}$$

$$(a + \frac{1}{a} + \sqrt{r})(a + \frac{1}{a} - \sqrt{r})^r = ((a + \frac{1}{a})^r - (\sqrt{r})^r) = (a + \frac{1}{a} + r\sqrt{r})^r = \boxed{170}$$

$$a^r + r + \frac{1}{a^r} = \sqrt{r} - \sqrt{r} + \frac{1}{\sqrt{r} - \sqrt{r}} + r = \sqrt{r} + \frac{-1\sqrt{r} + r}{\sqrt{r} - \sqrt{r}} + r = \sqrt{r} - \sqrt{r} + r = r$$

$$r = r^2 \Rightarrow \boxed{t=1}$$

$$A = \sqrt[10]{\sqrt[10]{r} \cdot \sqrt[10]{r} \cdot \sqrt[10]{r}} = r^{\frac{1}{10}} \cdot r^{\frac{1}{10}} \cdot r^{\frac{1}{10}} = r^{\frac{3}{10}} = r^{\frac{1}{10}} \cdot r^{\frac{2}{10}} = r^{\frac{1}{10}} \cdot r^{\frac{1}{5}}$$

$$(rA)^{\frac{1}{r}} = r^{\frac{1}{10}} \cdot r^{\frac{1}{5}} = (r^{\frac{3}{10}})^{\frac{1}{r}} = \boxed{r^{\frac{3}{10r}}} = \sqrt[10]{r^{\frac{3}{r}}}$$

$$\boxed{18}$$

$$\sqrt[10]{a} = r\sqrt[10]{a^{\frac{1}{10}}} \rightarrow r\sqrt[10]{a^{\frac{1}{10}}} = a^{\frac{1}{10}} \times a^{\frac{1}{10}} = a^{\frac{1}{10}} = a^{-r} = r\sqrt[10]{a^{\frac{1}{10}}}$$

$$\frac{1}{a^r} = r\sqrt[10]{a^{\frac{1}{10}}} \rightarrow \frac{1}{a} = \sqrt[10]{a^{\frac{1}{10}}} \rightarrow \frac{1}{a} = r\sqrt[10]{a^{\frac{1}{10}}}$$

$$\frac{\frac{1}{a} - r}{1 + \sqrt{r}} = \frac{r\sqrt{r} - r}{1 + \sqrt{r}} = \frac{r(\sqrt{r} - 1)}{1 + \sqrt{r}} \times \frac{\sqrt{r} - 1}{\sqrt{r} - 1} = \frac{r(\sqrt{r} - 1)^2}{1 - r} = \frac{r(r - 2\sqrt{r} + 1)}{-r} = \frac{r - 2\sqrt{r} + 1}{-1}$$

$$\boxed{-1 - 2\sqrt{r} + 1} = \boxed{-2\sqrt{r}}$$

$$\boxed{19}$$

$$\sqrt{11a} - \sqrt{11r} = r$$

$$\sqrt{11a} + \sqrt{11r} - r = \sqrt{11a} + \sqrt{11r} - \sqrt{11a} + \sqrt{11r} = \boxed{2\sqrt{11r}}$$

$$\boxed{20}$$

$$\sqrt[4]{(4+\sqrt{5})^{-1}} \times \sqrt[4]{(1+\sqrt{5})^2} = \sqrt[4]{\frac{5+1+2\sqrt{5}}{4+\sqrt{5}}} = \sqrt[4]{\frac{1+2\sqrt{5}}{4+\sqrt{5}}} = \sqrt[4]{2} \quad \text{ج-۲}$$

$$\frac{\sqrt{2+\sqrt{5}}}{\sqrt{1.} + 2} = \frac{\sqrt{2+\sqrt{5}}}{\sqrt{2}(\sqrt{5}+\sqrt{2})} = \frac{1}{\sqrt{2}} \quad \text{ب-۲}$$

$$(\underbrace{\sqrt{3-\sqrt{5}} - \sqrt{3+\sqrt{5}}}_b)^2 = 3-\sqrt{5} + 3+\sqrt{5} - 2\sqrt{9-5} = 4-4 = 0 \rightarrow b^2 = 0 \xrightarrow{b < 0} b = -\sqrt{2} \rightarrow \frac{1}{\sqrt{2}} \times (-\sqrt{2}) = -1$$

$$\frac{\sqrt{1} + \sqrt{2}\sqrt{3}}{5 - \sqrt{4}} = \frac{2\sqrt{2} + 3\sqrt{3}}{5 - \sqrt{2}} \times \frac{5 + \sqrt{2}}{5 + \sqrt{2}} = \frac{10\sqrt{2} + 15\sqrt{3} + 5\sqrt{2} + 2}{19} = \sqrt{2} + \sqrt{3} \quad \text{ج-۳}$$

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

$$\frac{3\sqrt{3} - 1}{4 + \sqrt{3}} \times \frac{4 - \sqrt{3}}{4 - \sqrt{3}} = \frac{12\sqrt{3} - 4 - 2 + \sqrt{3}}{13} = \sqrt{3} - 1 \quad \left. \begin{array}{l} \\ \end{array} \right\} \sqrt{3} - 1 + 2 + \sqrt{3} = 2\sqrt{3} + 1$$

$$\frac{1}{2 - \sqrt{3}} \times \frac{2 + \sqrt{3}}{2 + \sqrt{3}} = \frac{2 + \sqrt{3}}{1}$$

$$\sqrt{1 + \sqrt{3}} + \sqrt{\sqrt{3} - 1} = A \quad \text{د-۲}$$

$$A^2 = 1 + \sqrt{3} + \sqrt{3} - 1 + 2\sqrt{\sqrt{3} - 1} = 2\sqrt{3} + 2\sqrt{2}$$

$$A = \sqrt{2}(\sqrt{\sqrt{3} + 2})$$

$$\frac{\sqrt{2}(\sqrt{\sqrt{3} + 2})}{\sqrt{\sqrt{3} - 2}} = \sqrt{2} \sqrt{\frac{\sqrt{3} + 2}{\sqrt{3} - 2}} = \sqrt{2} \sqrt{\frac{(\sqrt{3} + 2)^2}{3 - 2}} = \sqrt{2}(\sqrt{3} + 2) = \sqrt{4} + 2 \xrightarrow{-2} \text{عبادت} = \sqrt{4}$$

د-۳

$$\left. \begin{array}{l} \sqrt[4]{\sqrt[3]{27}} = \sqrt[4]{27^{\frac{1}{3}}} = \sqrt[4]{27^{\frac{4}{12}}} = \sqrt[4]{147} = \sqrt[4]{147} \times \sqrt[4]{27} = 3 \times \sqrt[4]{3} \\ \sqrt[4]{27} = (27^{\frac{1}{4}} \times \frac{1}{4}) = \sqrt[4]{3} \end{array} \right\} \left(2^{\frac{1}{2}} + \frac{1}{2} + \frac{1}{12} \right) \times 3 = \frac{1+3+1}{12} \times 3 = 4 \times 3 = 12$$

$$\left(\left(a + \frac{1}{a} \right)^2 - 2 \right)^2 = \left(a^2 + \frac{1}{a^2} \right)^2 = a^4 + \frac{1}{a^4} + 2$$

$$\frac{1}{v-4\sqrt{3}} \times \frac{v+4\sqrt{3}}{v+4\sqrt{3}} = \frac{v+4\sqrt{3}}{49-48} = v+4\sqrt{3}$$

$$a^4 + \frac{1}{a^4} + 2 = v - 4\sqrt{3} + v + 4\sqrt{3} + 2 = 14 \rightarrow r^t = 14 \rightarrow \boxed{t=4}$$

د عبارت داده شده در صورت سوال یادآور اتحاد مزدوج است! ...

$$\underbrace{(\sqrt{n+a} - \sqrt{n-4})}_r \underbrace{(\sqrt{n+a} + \sqrt{n-4})}_t = n+a - n - (-4) = a+4$$

$$rt = a+4 \rightarrow t = \frac{a}{r} + r \rightsquigarrow t-r = \frac{a}{r} + r - r = \frac{a}{r}$$