

$$C(11+21+31+\dots+281) \quad C(21+41+61+\dots+241)$$

$$1+4=5 \quad 2+6=8$$

$$5 \times 8 = 40 \rightarrow \boxed{2 \text{ یکان}}$$

الف) $\sqrt[4]{(4+\sqrt{5})^{-1}} \sqrt[4]{1+\sqrt{5}} = \sqrt[4]{\frac{1}{4+\sqrt{5}}} + \sqrt[4]{(1+\sqrt{5})^2}$

$$= \sqrt[4]{\frac{1}{4+\sqrt{5}} \times 1+2\sqrt{5}} = \sqrt[4]{\frac{1}{4+\sqrt{5}} \times 2(4+\sqrt{5})} = \sqrt[4]{2}$$

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

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

الف) $\frac{\sqrt{8}+\sqrt{27}}{8-\sqrt{4}} - 2(\sqrt{3}-1)^{-1} = \frac{1}{4} \sqrt{2(8-1)}^2 - \frac{1}{4} \sqrt{2(8+1)}^2 = \frac{1}{4} \times \sqrt{8-1} - \frac{1}{4} \times \sqrt{8+1}$

$$= \frac{1}{4} (\sqrt{8-1} - \sqrt{8+1}) = \boxed{-1}$$

$$= \frac{5\sqrt{8} + \sqrt{48} + 5\sqrt{27} + \sqrt{16}}{10\sqrt{2} + 4\sqrt{3} + 15\sqrt{3} + 9\sqrt{2}} = \frac{19\sqrt{2} + 19\sqrt{3}}{19} = 19(\sqrt{2}+\sqrt{3}) = \sqrt{2}+\sqrt{3}$$

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

$$\Rightarrow \frac{\sqrt{3}-1}{4+\sqrt{3}} = \frac{4\sqrt{3}-\sqrt{3}-4+\sqrt{3}}{12\sqrt{3}-9-4+\sqrt{3}} = \frac{3\sqrt{3}-1}{13\sqrt{3}-13} = \frac{3\sqrt{3}-1}{13(\sqrt{3}-1)}$$

الف) $\sqrt{4\sqrt{3}+\sqrt{3}-1} - 2 = A-2 \Rightarrow A^2 = 4\sqrt{3}+\sqrt{3}-1 + 2\sqrt{(4\sqrt{3}+\sqrt{3}-1)(\sqrt{3}-1)}$

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

الف) $\sqrt[4]{144} = \sqrt[4]{2 \times 81} = 3\sqrt[4]{2}$

$$\sqrt[4]{4\sqrt{2}} = \sqrt[4]{2 \times 2\sqrt{2}} = \sqrt[4]{2 \times 2^{\frac{1}{2}} \times 2} = \sqrt[4]{2^{\frac{5}{2}}} = 2^{\frac{5}{8}} = 2\sqrt[4]{2} = \boxed{12}$$

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$$a = \sqrt[3]{\sqrt{4}-2}, b = \sqrt[3]{\sqrt{4}+2}$$

$$(a^3 + b^3 - 2ab)(a^3 + b^3 + 2ab) = (2 - \sqrt{4})$$

$$\begin{aligned} (a^3 + b^3 - 2ab)(a^3 + b^3 + 2ab) &= (a^3 + b^3 + 2ab - 2ab)(a^3 + b^3 - 2ab + 2ab) \\ &= \sqrt{4}-2 + \sqrt{4}+2 - 2\sqrt{(\sqrt{4}-2)(\sqrt{4}+2)} = (2\sqrt{4}-2\sqrt{4}) = 4-4-2\sqrt{4} \\ &= 2+2-2\sqrt{4} = 2-2\sqrt{4} = 2(1-\sqrt{4}) = 2(1-2) = 2(-1) = -2 \end{aligned}$$

$$a = \sqrt[3]{v - \sqrt{v}}, (a + \frac{1}{a} + \sqrt{v})(a + \frac{1}{a} - \sqrt{v}) = v +$$

$$\begin{aligned} (a + \frac{1}{a} + \sqrt{v})(a + \frac{1}{a} - \sqrt{v}) &= (a + \frac{1}{a} + \sqrt{v} - \sqrt{v})(a + \frac{1}{a} - \sqrt{v} + \sqrt{v}) \\ &= v - \sqrt{v} + v + \sqrt{v} + 2 = 2v = 2 \end{aligned}$$

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

$$\begin{aligned} A &= \sqrt[5]{\sqrt[3]{\sqrt{4}}} \left(\frac{1}{\sqrt[3]{\sqrt{4}}}\right)^{-\frac{1}{5}} = \sqrt[5]{\frac{1}{\sqrt{4}}} \times \sqrt[5]{\frac{1}{\sqrt{4}}} = \sqrt[5]{\frac{1}{\sqrt{4}}} \times \sqrt[5]{\frac{1}{\sqrt{4}}} = \sqrt[5]{\frac{1}{\sqrt{4}}} = \sqrt[5]{\frac{1}{2}} = \frac{1}{\sqrt[5]{2}} \\ (2A)^{-\frac{1}{5}} &= 1 \quad (2 \times \frac{1}{\sqrt[5]{2}})^{-\frac{1}{5}} = (2^{-\frac{1}{5}})^{-\frac{1}{5}} = 2^{\frac{1}{25}} = \frac{1}{\sqrt[25]{2}} \end{aligned}$$

$$a > 0 \quad \frac{\frac{1}{a} - v}{1 + \sqrt{v}} = 1$$

$$a^{\frac{1}{v}} = v a^{\frac{1}{v}} \Rightarrow v v = a^{-\frac{1}{v}} = a^{-\frac{1}{v}} = \left(\frac{1}{a}\right)^{\frac{1}{v}} \Rightarrow \frac{1}{a} = \sqrt{v}$$

$$\frac{\sqrt{v} - v}{1 + \sqrt{v}} = \frac{\sqrt{v} - v}{1 + \sqrt{v}} = \frac{\sqrt{v}(\sqrt{v} - \sqrt{v})}{1 + \sqrt{v}} = -\sqrt{v} + v$$

$$\begin{aligned} \sqrt{x+d} - \sqrt{x-f} &= 1 \quad \frac{(\sqrt{x+d} - \sqrt{x-f})(\sqrt{x+d} + \sqrt{x-f})}{+} = \frac{d+f}{+} \\ &\quad \downarrow \\ &\quad x+d - x+f \\ \sqrt{x+d} + \sqrt{x-f} - 1 &= 1 \quad + = \frac{d+f}{1} = \frac{d}{1} + 1 \\ &\quad \downarrow \\ \frac{d}{1} + 1 - 1 &= \frac{d}{1} \end{aligned}$$