

مربب فی فی فی

۱- در هر ۲ پرانتز عدد از این رقم یکان ضرب شود

$$\checkmark \quad 1! = 1, 3! = 6 \quad \text{در یک تریل فرد}$$

$$2! = 2, 4! = 24 \quad \text{در هر زوج}$$

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$$4 \times 7 = 28 \Rightarrow 12 \text{ رقم یکان}$$

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$$\sqrt{1+\sqrt{5}} \quad \sqrt{(4+\sqrt{5})^{-1}}$$

الف

$$\sqrt{\frac{2}{(1+\sqrt{5})^2}} = \frac{\sqrt{2}}{\sqrt{1+\sqrt{5}}} \times \sqrt{1+\sqrt{5}} = \sqrt{2}$$

1.75

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

$$A^2 = \frac{3-\sqrt{5}+2+\sqrt{5}}{\sqrt{10}+2} = \frac{5}{\sqrt{10}+2}$$

$$6-4=2 \rightarrow A = \sqrt{2}$$

$$\sqrt{2} + \sqrt{5} \times \sqrt{2} = 1$$

$$\sqrt{2}(\sqrt{5}+\sqrt{2})$$

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

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

$$\frac{10\sqrt{2} + 1\sqrt{2} + 14\sqrt{2} + 9\sqrt{2}}{12} = \frac{12\sqrt{2} + 9\sqrt{2}}{12}$$

$$\frac{12(\sqrt{2} + \sqrt{3})}{12} = \boxed{\sqrt{2} + \sqrt{3}}$$

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

$$\boxed{-1 - \sqrt{2}} \quad \sqrt{2 + \sqrt{2} - \sqrt{2}} - 1$$

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$$\therefore \frac{2\sqrt{3}-1(\epsilon-\sqrt{3})}{\epsilon+\sqrt{3}(\epsilon-\sqrt{3})} = \frac{12\sqrt{3}-9-1^2+\sqrt{3}}{12}$$

$$\frac{12\sqrt{3}-12}{12} = \frac{12(\sqrt{3}-1)}{12} = \sqrt{3}-1$$

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

$$\sqrt{3}-1+1+\sqrt{3}=1+\sqrt{3}$$

الف) $\sqrt{1 + \sqrt{3} + \sqrt{3} - 1}$

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$\sqrt{\sqrt{3} - \sqrt{2}}$

مثلاً

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

$\frac{\cancel{\sqrt{3}} + \cancel{\sqrt{2}} + 3 + \sqrt{6}}{3 - 2} + \frac{3 + \sqrt{6} - \cancel{\sqrt{3}} - \cancel{\sqrt{2}}}{3 - 2} = 6 + \sqrt{6}$

$6 + \sqrt{6}$

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$$\sqrt[3]{\frac{12}{\sqrt{2}}} \times \sqrt[3]{162} \times \sqrt[3]{\frac{8 \times \sqrt{2}}{2}} =$$

$$\sqrt[3]{\frac{12}{\sqrt{2}}}$$

$$\sqrt[3]{\frac{12}{\sqrt{2}}} = \sqrt[3]{\frac{12}{\sqrt{2}}}$$

$$\times \sqrt[3]{162}$$

$$\times \sqrt[3]{\frac{8 \times \sqrt{2}}{2}} =$$

$$\sqrt[3]{12} \times \sqrt[3]{162} \times \sqrt[3]{\frac{8 \times \sqrt{2}}{2}} =$$

$$\sqrt[3]{12}$$

$$\text{و) } \sqrt{a} + \sqrt{4a} - 2(\sqrt{a} - 1) =$$

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$$r^n (1 + r + r^2 + r^3 + r^4 + r^5) = r^n \times r^6 \epsilon \quad - \Delta$$

$$\underbrace{1 + r + r^2 + r^3 + r^4 + r^5}_{= r^6 \epsilon} = r^6 \epsilon$$

$$r^{n-1} (1 + r + r^2 + \dots + r^{n-1}) = r^{n-1} \times r \epsilon$$

$$r^n \times r^6 \epsilon = a r \Rightarrow \frac{r^n}{r^{n-1}} = r^n \times \frac{r}{r^n} = \epsilon \left(\frac{r}{r} \right)$$

$$\epsilon \left(\frac{r}{r} \right)^n = a \rightarrow \left(\frac{r}{r} \right)^n = \frac{a}{\epsilon} \rightarrow \boxed{n = 1}$$

Ⓟ ✓

$$ab = \sqrt{(r^2 - r)(r^2 + r)} = \sqrt{r} \quad - \Delta$$

$$a^2 b^2 = r$$

$$a^2 + b^2 = n \rightarrow n^2 = a^2 + b^2 + 2ab$$

$$\underbrace{\quad}_{r \sqrt{r}}$$

$$n^2 = r \sqrt{r} + r \sqrt{r}$$

$$(a^2 + b^2 - 2ab)^2 (a^2 + b^2 + 2ab)^2$$

$$[(a^2 + b^2)^2 - (2ab)^2]^2 = (n^2 - 2a^2 b^2)^2$$

$$\Rightarrow \frac{r(\sqrt{r} - \sqrt{r})^2}{r - \epsilon \sqrt{r}} = \frac{r(\sqrt{r} - \sqrt{r})^2}{r(\sqrt{r} - \sqrt{r})}$$

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$$E(1 - 4\sqrt{3}) = 12 - 16\sqrt{3}$$

$$16(2 - \sqrt{3})$$

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$$a = \sqrt{(r - \sqrt{r})^r} = \sqrt{r - \sqrt{r}} \quad - \checkmark$$

$$\frac{1}{a} = \sqrt{r + \sqrt{r}} \quad \checkmark$$

$$\left(a + \frac{1}{a}\right)^r = (\cancel{r - \sqrt{r}}) + (\cancel{r + \sqrt{r}}) + r \underbrace{\sqrt{(r - \sqrt{r})(r + \sqrt{r})}}_1$$

$$= 2 \Rightarrow a + \frac{1}{a} = \sqrt{2}$$

$$(\sqrt{2} + \sqrt{r})^r (\sqrt{2} - \sqrt{r})^r = (\sqrt{2}^r - \sqrt{r}^r)^r = 1 \quad \checkmark$$

$$1 = r^t \rightarrow t = \frac{1}{r} \quad \textcircled{2} \quad \checkmark$$

$$\sqrt[r]{r^{\frac{1}{r}} \times \sqrt[r]{1}} \times \sqrt[r]{\frac{1}{r}} = \sqrt[r]{r^{\frac{1}{r}} \times \frac{1}{r}} \quad - \checkmark$$

$$r^{\frac{1}{r}} \times r^{-\frac{1}{r}} = r^{\frac{1}{r} - \frac{1}{r}}$$

$$\sqrt[r]{r^{\frac{1}{r}}} = r^{\frac{1}{r}} \times r^{-\frac{1}{r}} = r^0 = 1$$

$$(rA)^{-\frac{1}{r}} = (r^r)^{-\frac{1}{r}} = r^{-1} = \frac{1}{r}$$

$$\textcircled{2} \quad \checkmark$$

$$\frac{a^{\frac{1}{\sqrt{v}}}}{a^{\frac{1}{\sqrt{v}}}} = \frac{r\sqrt{v} a^{\frac{1}{\sqrt{v}}}}{a^{\frac{1}{\sqrt{v}}}}$$

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

$$a = \frac{1}{\sqrt{r\sqrt{v}}} = \frac{1}{r\sqrt{v}}$$

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

$$\frac{r\sqrt{v} - r}{-r} = \boxed{\frac{r - r\sqrt{v}}{r}}$$

$$(\sqrt{n+a} + \sqrt{n-\epsilon})(\sqrt{n+a} - \sqrt{n-\epsilon})$$

$$= n+a - n+\epsilon$$

$$a+\epsilon = r(\sqrt{n+a} + \sqrt{n-\epsilon})$$

$$\sqrt{n+a} + \sqrt{n-\epsilon} = \frac{a+\epsilon}{r} \cdot r =$$

$$\frac{\epsilon+a+\epsilon}{r}$$

$$\boxed{\frac{a}{r}}$$

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

ب. ۴

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

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

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

$$\frac{\sqrt{3}+\sqrt{2}}{\sqrt{3}-\sqrt{2}} \times \frac{\sqrt{3}+\sqrt{2}}{\sqrt{3}+\sqrt{2}} = \boxed{(\sqrt{3}+\sqrt{2})^2}$$

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