

① $\frac{(1!+3!)(1!+4!)}{2!} = 21$
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② $\sqrt{\frac{1}{4+5\sqrt{2}}} \times \sqrt{(1+5\sqrt{2})^2} = \sqrt{\frac{1}{4} \times \frac{(4+5\sqrt{2})(4+5\sqrt{2})}{2^2}} = 4\sqrt{2}$
 $14-7=9$

ب) $\frac{5\sqrt{2}+5\sqrt{2}}{5\sqrt{2}(5\sqrt{2}+5\sqrt{2})} = \frac{1}{5\sqrt{2}}$ $t^2 = 4-5\sqrt{2}+4+5\sqrt{2}-4 = 2 \rightarrow H=5\sqrt{2}$
 خد کیکم از صفر است

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

③ $\frac{5\sqrt{2}+13\sqrt{2}(2+5\sqrt{2})}{2-5\sqrt{2}(2+5\sqrt{2})} \times \frac{1}{(\sqrt{2}-1)(\sqrt{2}+1)} = \frac{19\sqrt{2}+14\sqrt{2}-\sqrt{2}-1}{19}$

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

ب) $\frac{5\sqrt{2}-1(4-5\sqrt{2})}{(4+5\sqrt{2})(4-5\sqrt{2})} = \frac{13\sqrt{2}-1\sqrt{2}}{16} = \sqrt{2}-1$ $\left\{ \begin{array}{l} 2\sqrt{2}+1 \end{array} \right.$
 $(2-5\sqrt{2})^{-1} = \frac{1}{(2-5\sqrt{2})(2+5\sqrt{2})} = 2+5\sqrt{2}$

④ $\left(\frac{\sqrt{2+5\sqrt{2}} + \sqrt{2-5\sqrt{2}}}{\sqrt{2+5\sqrt{2}} - \sqrt{2-5\sqrt{2}}} \right) \times \frac{1}{t-2} = \frac{13\sqrt{2}-1+5\sqrt{2}+13\sqrt{2}(5\sqrt{2}-5\sqrt{2})}{5\sqrt{2}-5\sqrt{2} \times (5\sqrt{2}-5\sqrt{2})} \xrightarrow{\text{جواب}} \sqrt{2}+2$
 $\rightarrow t-2 = \sqrt{2}$

$$\textcircled{7} \left[(a+b)^r - (rab)^r \right]^r = \left[a^r + b^r + r a^{r-1} b^r - r a^r b^{r-1} \right]^r$$

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

$$2\sqrt{4} - r = \cancel{2\sqrt{4} - r} - \cancel{2\sqrt{4} - r}$$

$$\hookrightarrow \left(2(\sqrt{4} - \sqrt{r}) \right)^r = r(1 - r \times \sqrt{4})$$

$$19(1 - \sqrt{r}) \rightarrow \boxed{t = 19}$$

$$\textcircled{\checkmark} \left[\left(a + \frac{1}{a} \right)^r - r \right]^r = \left[\left(a^r + \frac{1}{a^r} + r - r \right) \right]^r = \left(\frac{1}{a^r} + a^r \right)^r$$

$$\frac{1}{a^r} + a^r + r = \sqrt{4} - r\sqrt{r} + \frac{1}{\sqrt{4} - r\sqrt{r}} + r = \sqrt{4} - r\sqrt{r} + \frac{\sqrt{4} + r\sqrt{r}}{4 - r^2} + r$$

$$18 + r = 19 = r^t \rightarrow \boxed{t = r}$$

$$r \times 19 = 18$$

Q

$$\frac{u^n (1 + \frac{1}{2} + \frac{1}{4} + \dots + \frac{1}{2^{n-1}})}{u^n} = 2^n \quad \text{--- (1)}$$

$$u^n \left(\frac{1}{2} + \frac{1}{4} + \dots + \frac{1}{2^{n-1}} \right)$$

$$\frac{u^n \times v}{u^n \times \frac{1}{2}} = 1$$

$$\frac{u^n \times v}{u^n \times \frac{1}{2}} = 1 \rightarrow \left(\frac{1}{2} \right)^n = \frac{9}{8} \Rightarrow \boxed{n=2}$$

Q

$$\textcircled{\wedge} \quad r^{\frac{1}{2}} \times r^{\frac{1}{2}} \times r^{\frac{1}{2}} = \frac{r + r + r}{r^{\frac{1}{2}}} = r^{\frac{3}{2}} = r = r$$

$$(r \times r)^{\frac{1}{2}} = \left(\frac{1}{\wedge}\right)^{\frac{1}{2}} = \frac{1}{(r^{\wedge})^{\frac{1}{2}}} = \frac{1}{r} = r^{-1}$$

$$\textcircled{A} \quad \sqrt[3]{a} = a^{\frac{1}{3}} \quad \frac{-1}{3} \quad r \quad -r \quad r$$

$$\frac{\sqrt{x+1} - \sqrt{x-1}}{1-\mu} \rightarrow \frac{\sqrt{x+1} - \sqrt{x-1}}{1-\mu}$$

$$(9) \quad a^{\frac{1}{\sqrt{\mu}}} = \mu a^{\frac{12}{\sqrt{\mu}}} \rightarrow a = \mu \rightarrow \frac{1}{a} = \frac{1}{\mu} = \frac{1}{\mu} \sqrt{\mu}$$

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

$$= \frac{10-9\sqrt{\mu}}{\mu} = \boxed{4-4\sqrt{\mu}}$$

$$(10) \quad \sqrt{x+a} - \sqrt{x-\epsilon} = r \xrightarrow{\times \sqrt{x+a} + \sqrt{x-\epsilon}} \sqrt{x+a} - \sqrt{x-\epsilon} = r(\sqrt{x+a} + \sqrt{x-\epsilon})$$

$$\frac{a}{r} + r = \sqrt{x+a} + \sqrt{x-\epsilon} \rightarrow \frac{a}{r} = \sqrt{x+a} + \sqrt{x-\epsilon} - r$$