$۱! \to ۱ \quad ۳! \to ۶ \quad ۵! \to \underbrace{۳\times۴\times۵}_{۲۰} \to ۰$ 1

$\underbrace{۲! \to ۲ \quad ۴! \to ۲۴ \quad ۶! \to ۰}_{۴+۲=۶}$ ۱و۶و۷

$۷\times۶=\boxed{۴۲} \to$ رقم یکان

الف) $\to \sqrt[۴]{(۴+\sqrt{۷})^{-۱}} \to \frac{۱}{\sqrt[۴]{۴+\sqrt{۷}}} \times \sqrt[۴]{(۱+\sqrt{۷})^۲} \to \sqrt{\frac{(۱+\sqrt{۷})^۲}{\frac{(۱+\sqrt{۷})^۲}{۲}}} \to \sqrt[۴]{۲}$ 2

$\frac{(۱+\sqrt{۷})^۲}{۲} \to ۱+۷+۲\sqrt{۷} = \frac{\overset{۴}{\cancel{۸}}+\overset{۱}{\cancel{۲}}\sqrt{۷}}{\cancel{۲}} \to ۴+\sqrt{۷}$

ب) $\to \left(\sqrt{۳-\sqrt{۵}}+\sqrt{۳+\sqrt{۵}}\right) \to \frac{\sqrt{۲}+\sqrt{۵}}{\sqrt{۱۰}+۲} \to \frac{\sqrt{۱۰}-۲}{\sqrt{۱۰}-۲}$

$\frac{\sqrt{۲۰}+\sqrt{۵۰}-۲\sqrt{۲}-۲\sqrt{۵}}{\cancel{۱۰-۴}\ ۶} \to \frac{۲\sqrt{۵}+۵\sqrt{۲}-۲\sqrt{۲}-۲\sqrt{۵}}{۶} = \frac{۳\sqrt{۲}}{۶} = \boxed{\frac{\sqrt{۲}}{۲}}$

صفحه بعد

$\frac{۳\sqrt{۲}+۳\sqrt{۳}}{۵-\sqrt{۶}} = \frac{۲\sqrt{۲}+۳\sqrt{۳}}{۵-\sqrt{۶}} \times \frac{۵+\sqrt{۶}}{۵+\sqrt{۶}}$ 3

$\frac{۱+\sqrt{۲}+۹\sqrt{۳}+۸\sqrt{۳}+۱۹\sqrt{۲}}{۱۹} = \frac{۱۹(\sqrt{۲}+\sqrt{۳})}{۱۹} = \sqrt{۲}+\sqrt{۳}$

$\frac{۱}{\sqrt{۳}-۱} \times \frac{\sqrt{۳}+۱}{\sqrt{۳}+۱} = \frac{\sqrt{۳}+۱}{۲}$ $\sqrt{۲}+\sqrt{۳}-\sqrt{۳}-۱ = \boxed{\sqrt{۲}-۱}$

ب) $\sqrt{۳}-۱+(۲+\sqrt{۳}) = ۴\sqrt{۳}$

$\frac{۳\sqrt{۳}-۱}{۴+\sqrt{۳}} \times \frac{۴-\sqrt{۳}}{۴-\sqrt{۳}} = \frac{۱۳\sqrt{۳}-۱۳}{۱۳} = \frac{\cancel{۱۳}(\sqrt{۳}-۱)}{\cancel{۱۳}} = \boxed{\sqrt{۳}-۱}$

الف) $\sqrt{\frac{2(\sqrt{3}+\sqrt{2})}{\sqrt{3}-\sqrt{2}} \times \frac{\sqrt{3}+\sqrt{2}}{\sqrt{3}+\sqrt{2}}} = \frac{2(5+2\sqrt{6})}{1} = \sqrt{10+4\sqrt{6}}$ (4)

$2+\sqrt{6}$ $\qquad (\sqrt{6}+2)^2 = 4+\sqrt{6}$

ب) $\sqrt[4]{3\sqrt{24}} \times \sqrt[4]{162} \times \sqrt{4\sqrt{2}} = 2^{\frac{23}{6}}$ $\qquad 2+\sqrt{6}-2=\sqrt{6}$

$\boxed{\frac{2}{3}+2+\frac{7}{6}=\frac{23}{6}}$

$$\frac{3^x(1+3+3^2+3^3+3^4+3^5)}{2^{x-2}(1+2+2^2+2^3+2^4+2^5)} = 52 = \frac{3^x}{2^{x+2}} = \frac{52}{9}$$ (5)

$\frac{3^x}{2^{x-2}} \to 3^{x-2} \to x-2=0 \rightsquigarrow \boxed{x=2}$

$[(a-b)^2(a+b)^2 = [a^2-b^2]^4 = 4(\sqrt{6}-\sqrt{2})^2 =$ (6)

$16(\sqrt{2}-\sqrt{3}) \Rightarrow 16(2-\sqrt{3}) = t(2-\sqrt{3})$ $\qquad 6+2-4\sqrt{3}$

$a^{\cancel{2}}b^{\cancel{2}} = 2(\sqrt{6}-\sqrt{2})$ $\qquad 4(8-4\sqrt{3})$

$4(2+\sqrt{3})$ 16

$\boxed{t=16}$

$(a+\frac{1}{a}+\sqrt{2})^2(a+\frac{1}{a}-\sqrt{2})^2 = 2b$ (7)

$\sqrt{2-\sqrt{3}} = \frac{\sqrt{6}-\sqrt{2}}{2}$ $\qquad a-\frac{1}{a} \Rightarrow \frac{\sqrt{6}+\sqrt{2}}{2} + \frac{\cancel{2}(\sqrt{6}+\sqrt{2})}{\cancel{4}}$

$a+\frac{1}{a} = \sqrt{6}$ $\qquad (6-2)^2 = 16 = 4 \rightsquigarrow t$

$A=\sqrt[5]{4^3\sqrt[3]{16}\,(\frac12)^{-\frac43}} \rightsquigarrow (2A)^{-\frac13}$ $\quad \{(\frac12)^{-\frac43}=2^{\frac43}$ 8

$\sqrt[3]{16}\to 16^{\frac13}=(2^4)^{\frac13}=2^{\frac43}$ $\quad A=\sqrt[5]{4\times2^{\frac43}\times2^{\frac43}}=\sqrt{4\times2^{\frac83}}$

$4=2^2\to A=\sqrt[5]{2^{2+\frac83}}=\sqrt[5]{2^{\frac{14}{3}}}=2^{\frac{14}{15}}$

$2A=2\times2^{\frac{14}{15}}\to 2^{\frac{29}{15}}$ صفحه بعد

$(2A)^{-\frac13}=\boxed{2^{-\frac{29}{45}}}$

$a^{\frac12}=27^{\frac{15}{2}}\to 27a^2=1$ $\quad \frac1a=3\sqrt3$ 9

$\frac{3\sqrt3-3}{1+\sqrt3}\times\frac{\sqrt3-1}{\sqrt3-1}=\frac{3(\sqrt3-1)^2}{2}=\frac{3(4-2\sqrt3)}{2}$ $\boxed{=6-3\sqrt3}$

$\sqrt{x+a}-\sqrt{x-4}=2$ $\quad (\sqrt{x+a}-\sqrt{x-4})^2=4$ 10

$(x+a)(x-4)-2\sqrt{(x+a)(x-4)}=4$ $\quad 2x+a-4-2\sqrt{(x+a)(x-4)}=4$

$2x+a-8=2\sqrt{(x+a)(x-4)}\to\sqrt{(x+a)(x-4)}=\frac{2x+a-8}{2}=$

$x+\frac a2-4$

$\sqrt{x+a}=\sqrt{x-4}+2\to\sqrt{x+a}+\sqrt{x-4}-2=$

$\sqrt{x-4}+2+\sqrt{x-4}-2=\boxed{2\sqrt{x-4}}$

کسری سبزعلی

$$2 \quad 2 \times 2^{\frac{4}{3}} = 2^{\frac{10}{3}}$$

8

$$\sqrt[5]{2^{\frac{10}{3}}} = 2^{\frac{2}{3}} \longrightarrow 2^{\frac{2}{3}} \times 2^{\frac{4}{3}} = 2^{2} \longrightarrow 4$$

$$(2A)^{-\frac{1}{3}} \longrightarrow (2^{3})^{-\frac{1}{3}} = 2^{-1} \longrightarrow \boxed{\frac{1}{2}} \qquad 8 = 2^{3}$$

جواب

2 قسمت ب

$$\frac{-2\sqrt{5}}{\sqrt{3-\sqrt{5}}+\sqrt{3+\sqrt{5}}} \longrightarrow \frac{\sqrt{2}+\sqrt{5}}{\sqrt{10}+2} \times \frac{-2\sqrt{5}}{\sqrt{10}} = \frac{-2\sqrt{10}-10}{10+2\sqrt{10}} = \boxed{-1}$$