Subject : ______ ۲۰ Date: ______

نام: فاطمه احمدی تکلیف شماره ۲۱ کلاس دهم ریاضی A

-۱ $(1!+3!+5!+\cdots+25!)(2!+4!+6!+\cdots+24!)$

یکان $1!+3! = 1+(1\times2\times3) = 7$ یکان $2!+4! = 2+(1\times2\times3\times4) = 26$ ، 6

$7\times6 = 42 \rightarrow$ یکان

-۲ الف) $\sqrt[4]{(4+\sqrt7)^{-1}} \times \sqrt{(1+\sqrt7)} = \sqrt[4]{(4+\sqrt7)^{-1}} \times \sqrt[4]{8+2\sqrt7} = \sqrt[4]{\frac{8+2\sqrt7}{4+\sqrt7}}$

$\sqrt[4]{(1+\sqrt7)^2} = (1+\sqrt7)^{\frac12=\frac24}$ ز ما $\sqrt[4]{\frac{2(\cancel{4+\sqrt7})}{\cancel{4+\sqrt7}}} = \sqrt[4]{2}$

ب) $\left(\frac{\sqrt2+\sqrt5}{\sqrt{10}+2}\right)\left(\sqrt{3-\sqrt5}-\sqrt{3+\sqrt5}\right) = \frac{\sqrt{3-\sqrt5}-\sqrt{3+\sqrt5}}{\sqrt2}\times\frac{\sqrt2}{\sqrt2} =$

ما $\frac{\sqrt2+\sqrt5}{\sqrt2(\sqrt5+\sqrt2)} = \frac{1}{\sqrt2}$

$\frac{\sqrt{6-2\sqrt5}-\sqrt{6+2\sqrt5}}{2}$

$\frac{\sqrt{(\sqrt5-1)^2}-\sqrt{(\sqrt5+1)^2}}{2} = \frac{\cancel{\sqrt5}-1-\cancel{\sqrt5}-1}{2} = \frac{-2}{2} = -1$

-۳ الف) $\frac{\sqrt8+\sqrt{27}}{5-\sqrt6} - 2(\sqrt[4]{9}-1)^{-1} = \frac{2\sqrt2+3\sqrt3}{(\sqrt2)^2+(\sqrt3)^2-\sqrt3\times\sqrt2} - \frac{2}{\sqrt3-1} =$

که چاق دارد

$\frac{(2\sqrt2+3\sqrt3)(\sqrt2+\sqrt3)}{((\sqrt2)^3+(\sqrt3)^3-\sqrt3\times\sqrt2)(\sqrt2+\sqrt3)} - \frac{2(\sqrt3+1)}{\cancel{3-1}\;2} = \sqrt2+\cancel{\sqrt3}-\cancel{\sqrt3}-1 = \sqrt2-1$

$(\cancel{2\sqrt2+3\sqrt3})$

ب) $\frac{\sqrt{27}-1}{4+\sqrt3} + (2-\sqrt3)^{-1} = \frac{12\sqrt3-4-9+\sqrt3}{\cancel{16-3}\;13} + \frac{2+\sqrt3}{\cancel{4-3}\;1} =$

$\frac{13\sqrt3-13}{13} + 2+\sqrt3 \Rightarrow \frac{\cancel{13}(\sqrt3-1)}{\cancel{13}} \Rightarrow \sqrt3-1+2+\sqrt3 = 2\sqrt3+1$

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

$(\sqrt{1+\sqrt{3}}+\sqrt{\sqrt{3}-1})(\sqrt{\sqrt{3}-\sqrt{2}}) \rightsquigarrow \sqrt[4]{[(\sqrt{1+\sqrt{3}}+\sqrt{\sqrt{3}-1})(\sqrt{\sqrt{3}-\sqrt{2}})]^4}$

$\sqrt{(2\sqrt{3}-2\sqrt{2})(\sqrt{3}-\sqrt{2})} = (\sqrt{3}-\sqrt{2})\sqrt{2} - 2 = \sqrt{6} - 4$

ب) $\sqrt[4]{\sqrt[3]{2^8}} \times \sqrt[4]{162} \times \sqrt{4\sqrt[6]{2}} = 3^{\frac{2}{4}} \times 2^{\frac{1}{4}} \times 3 \times 2 \times 2^{\frac{1}{12}} = 3 \times 4 = 12$

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

$\frac{3^x(1+3+9+\cdots+3^5)}{2^{x-2}(1+2+4+\cdots+2^5)} = \frac{3^x\left(\frac{3^6-1}{2}\right)}{2^{x-2}\left(\frac{2^6-1}{1}\right)} = \frac{3^x(\overbrace{\cancel{3^6-1}}^{364\times 28})}{2\times 2^{x-2}(\underbrace{\cancel{2^6-1}}_{63})} \Rightarrow \frac{\overset{3^{x-2}}{\cancel{3^x}} \times \overset{4}{\cancel{18}} \times \overset{2}{\cancel{24}}}{\cancel{2^{x-2}} \times \cancel{63}} = 54$

$\Rightarrow \frac{3^{x-2}}{2^{x-2}} = 1 \Rightarrow x=2$

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$a=\sqrt[4]{\sqrt{6}-2}$, $b=\sqrt[4]{\sqrt{6}+2}$ $\quad (a^2+b^2-2ab)^2(a^2+b^2+2ab)^2 = t(2-\sqrt{3})$

$((a^2+b^2)^2-4a^2b^2)^2 = (a^4+b^4+2a^2b^2-4a^2b^2)^2 = (a^4+b^4-2a^2b^2)^2 =$

$\left[(\sqrt[4]{\sqrt{6}-2})^4+(\sqrt[4]{\sqrt{6}+2})^4-2\underbrace{(\sqrt{\sqrt{6}-2})(\sqrt{\sqrt{6}+2})}_{\sqrt{2}}\right]^2 =$

$(2\sqrt{6}-2\sqrt{2})^2 = [2\sqrt{2}(\sqrt{3}-1)]^2 = 16(2-\sqrt{3}) = t(2-\sqrt{3}) \Rightarrow t=16$

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$a = \sqrt[۴]{۷-۴\sqrt{۳}} = \sqrt{(۲-\sqrt{۳})^۲} = \sqrt{۲-\sqrt{۳}}$ -۷

$(a+\frac{۱}{a}+\sqrt{۲})^۲(a+\frac{۱}{a}-\sqrt{۲})^۲ = ((a+\frac{۱}{a})^۲-۲)^۲ = (a^۲+\frac{۱}{a^۲}+۲-۲)^۲ = (a^۲+\frac{۱}{a^۲})^۲ =$

$(۲-\sqrt{۳}+\frac{۱}{۲-\sqrt{۳}})^۲ = (۲-\sqrt{۳}+۲+\sqrt{۳})^۲ = ۱۶ = ۲^t \rightarrow t=۴$

$A = \sqrt[۵]{۴\sqrt[۳]{۱۶}} = (\frac{۱}{۲})^{-\frac{۴}{۶}} = ۲^{\frac{۲}{۶}} \times ۲^{\frac{۴}{۶}} = ۴$ -۸

$(۲A)^{\frac{-۱}{۳}} = ۸^{\frac{-۱}{۳}} = \frac{۱}{۲}$

$۲۷a^{\frac{۱۵}{۷}} = a^{\frac{۱}{۷}} \longrightarrow ۲۷ \times a^۲ = ۱ \rightarrow a = \frac{۱}{۳\sqrt{۳}}$ -۹

$\frac{\frac{۱}{a}-۳}{۱+\sqrt{۳}} = \frac{۳\sqrt{۳}-۳}{۱+\sqrt{۳}} \times \frac{\sqrt{۳}-۱}{\sqrt{۳}-۱} = \frac{۳(۴-۲\sqrt{۳})}{۲} = ۶-۳\sqrt{۳}$

$(\sqrt{x+a}-\sqrt{x-۴})(\sqrt{x+a}+\sqrt{x-۴}) = a+۴$ -۱۰

$\sqrt{x+a}+\sqrt{x-۴} = \frac{a+۴}{۲} \rightsquigarrow \sqrt{x+a}+\sqrt{x-۴}-۲ = \frac{a}{۲}+۲-۲ = \frac{a}{۲}$