SA SU MO TU WE TH FR

Subj:

Date:

تکلیف شماره ۲۱ — مرکز محمدی زاده / دهم A

س ۱: $(\underbrace{1!+3!}_{1+6=7}+\underbrace{5!+\dots+25!}_{0})(\underbrace{2!+4!}_{26}+\underbrace{6!+\dots+24!}_{0})$

از ۵! به بعد یکان صفر می شود

$26\times7 \rightarrow$ یکان $=\boxed{2}$

س ۲: الف) $\sqrt[4]{\frac{1}{4+\sqrt7}(1+\sqrt7)^2}=\sqrt[4]{\frac{4-\sqrt7}{9}\times(8+2\sqrt7)}=\sqrt[4]{\frac{(4-\sqrt7)(4+\sqrt7)2}{9}}$

توزیع :

$\sqrt[4]{\frac{(16-7)2}{9}}=\boxed{\sqrt[4]{2}}$

ب) $\left(\frac{(\sqrt2+\sqrt5)(\sqrt{10}-2)}{\underbrace{\sqrt{10}+2\,(\sqrt{10}-2)}_{6}}\right)=\frac{3\sqrt2}{6}=\frac{\sqrt2}{2}\left(\sqrt{3-\sqrt5}-\sqrt{3+\sqrt5}\right)=$

$\frac{\sqrt{6-2\sqrt5}-\sqrt{6+2\sqrt5}}{2}=\frac{\sqrt{(\sqrt5-1)^2}-\sqrt{(\sqrt5+1)^2}}{2}=$

$\frac{\sqrt5-1-\sqrt5-1}{2}=\boxed{-1}$

س ۳: الف) $\frac{(2\sqrt2+3\sqrt3)(5+\sqrt6)}{(5-\sqrt6)(5+\sqrt6)}=\frac{10\sqrt2+15\sqrt3+6\sqrt3+9\sqrt2}{19}=\frac{\cancel{19}(\sqrt2+\sqrt3)}{\cancel{19}}=\sqrt2+\sqrt3$

$-2(\sqrt3-1)^{-1}=-2\left(\frac{\sqrt3+1}{(\sqrt3-1)(\sqrt3+1)}\right)=-\sqrt3-1$

$-\sqrt3-1+\sqrt2+\sqrt3=\boxed{\sqrt2-1}$

ب) $\frac{3\sqrt3-1}{(4+\sqrt3)(4-\sqrt3)}(4-\sqrt3)\Rightarrow\frac{13\sqrt3-13}{13}=\sqrt3-1$

$\frac{1}{2-\sqrt3}\times\frac{(2+\sqrt3)}{(2+\sqrt3)}=2+\sqrt3$

$\boxed{2\sqrt3+1}$

س ۴:

الف) $\left(\sqrt{(1+\sqrt{3})(\sqrt{3}+\sqrt{2})} + \sqrt{(\sqrt{3}-1)(\sqrt{3}+\sqrt{2})}\right)^2$

ضرب میکنیم ← $1 = \left(\sqrt{\sqrt{3}-\sqrt{2}}\right)\left(\sqrt{\sqrt{3}+\sqrt{2}}\right)$

$$\left(\sqrt{\underbrace{(3+\sqrt{6})}_{a}+\underbrace{(\sqrt{3}+\sqrt{2})}_{b}} + \sqrt{\underbrace{(3+\sqrt{6})}_{a}-\underbrace{(\sqrt{3}+\sqrt{2})}_{b}}\right)^2 = \left(\sqrt{a+b}+\sqrt{a-b}\right)^2 = 2a+2\sqrt{a^2-b^2}$$

به توان ۲ میرسانیم

$$2\underbrace{(3+\sqrt{6})}_{a} + 2\sqrt{\underbrace{(3+\sqrt{6})^2-(\sqrt{3}+\sqrt{2})^2}_{a^2-b^2}}$$

$6+2\sqrt{6}$

$10+4\sqrt{6} = \sqrt{(\sqrt{6}+2)^2} = 2\sqrt{6}+4$

$$10+4\sqrt{6} \xRightarrow{\text{جذر میگیریم}} \sqrt{10+4\sqrt{6}} = \sqrt{6}+2 \to \sqrt{6}+2-2 = \boxed{\sqrt{6}}$$

$(\sqrt{6}+2)^2$

ب) $\sqrt[12]{2^9} \times \sqrt[4]{81\times 2} \times \sqrt[12]{2^{13}} = \sqrt[12]{2^{24}\times 3^{12}} = 2^2\times 3 = \boxed{12}$

$\sqrt[12]{3^{12}\times 2^3}$

س ۵:

$\to a=1,\ q=3 \to S=\left(\frac{3^6-1}{2}\right)=364$

$$\frac{3^n\left(1+3+3^2+3^3+3^4+3^5\right)}{2^n\left(\frac{1}{4}+\frac{1}{2}+1+2+4+8\right)} = 52$$

$a=\frac{1}{4}$, $q=2$ $\Big\}$ $S=\frac{1}{4}\left(\frac{2^6-1}{1}\right)=\frac{63}{4}$

$\Rightarrow \frac{3^n}{2^n} = \frac{225}{...} = \frac{9}{4} \Rightarrow \boxed{n=2}$

س ۶:

$\left((a+b)^2\right)^2\left((a-b)^2\right)^2 = (a^2-b^2)^4$

$\sqrt{\sqrt{6}-2} = a^2,\ b^2 = \sqrt{\sqrt{6}+2} \Rightarrow (a^2-b^2)^2 = (\sqrt{6}-2)+(\sqrt{6}+2)+2\sqrt{\;}$

$(\sqrt{6}-2)(\sqrt{6}+2)$ $=$

$(2\sqrt{6}-2\sqrt{2})^2 = 32-16\sqrt{3} = t(2-\sqrt{3})$

$\to (a^2-b^2)^4$

$\boxed{t=16}$

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س ۷:

$a = \sqrt[4]{7-4\sqrt{3}}$

مزدوج

$\left(a+\frac{1}{a}+(\sqrt{2})\right)^2\left(a+\frac{1}{a}-(\sqrt{2})\right)^2 = \left(\left(a^2+\frac{1}{a^2}+2\right)-2\right)^2 =$

گویا

$\frac{1}{a^4}+a^4+2 = \frac{1}{7-4\sqrt{3}}+7-4\sqrt{3}+2 = 7+4\sqrt{3}+7-4\sqrt{3}+2 = \boxed{16}$

$2^t = 16 \Rightarrow \boxed{t=4}$

س ۸:

$A = \sqrt[5]{4\sqrt[3]{16}} = \sqrt[15]{2^{10}} = \sqrt[3]{4}$

$\left(\frac{1}{2}\right)^{-\frac{4}{3}} = (2)^{\frac{4}{3}} = \sqrt[3]{2^4}$

$x = \sqrt[3]{2^6} = 2^2 = 4 = A$

$(2A)^{-\frac{1}{4}} = \left(\frac{1}{8}\right)^{\frac{1}{3}} = \sqrt[3]{\frac{1}{8}} = \boxed{\frac{1}{2}}$

س ۹:

$a^{\frac{1}{7}} = 27\times a^{\frac{15}{7}} \Rightarrow a^{\frac{1-15}{7}} = 27 \Rightarrow \frac{1}{a^2} = 27 \to \frac{1}{a} = \sqrt{27}$

$\Rightarrow a^{-2} \to 3(\sqrt{3}-1)$

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

$3(\sqrt{3}-1)^2 = (4-2\sqrt{3})3 = 12-6\sqrt{3} \Rightarrow \frac{2(6-3\sqrt{3})}{2}$ $\boxed{= 6-3\sqrt{3} \text{ جواب}}$

س ۱۰:

$\left.\begin{array}{l}\sqrt{x+a} = u \\ \sqrt{x-4} = v\end{array}\right\}$ $u^2-v^2 = (u+v)(u-v)$

$\underbrace{x+a-(x-4)}_{a+4} = \left(\sqrt{x+a}+\sqrt{x-4}\right)\underbrace{\left(\sqrt{x+a}-\sqrt{x-4}\right)}_{2}$

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