نام خانوادگی .... پاسخنامه تشریحی تکلیف شماره .... کلاس ....

1

$$(1!+3!+5!+\dots+95!)(2!+4!+6!+\dots+26!)$$

$1,\ 6,\ 0,\ 0$; $2,\ 4,\ 0,\ 0$

$$(7)(6)=4\,2$$

2

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

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

$$\frac{1}{\sqrt2}\left(\cancel{\frac{\sqrt3+\sqrt5}{\sqrt5+\sqrt3}}\right)\left(\sqrt{3-\sqrt5}-\sqrt{3+\sqrt5}\right)=\frac{\sqrt2}{2}\left(\sqrt{3-\sqrt5}-\sqrt{3+\sqrt5}\right)=\frac{\sqrt{6-2\sqrt5}-\sqrt{6+2\sqrt5}}{2}=$$

3

الف) $$\frac{2\sqrt2+3\sqrt3}{5-\sqrt6}-\frac{2}{\sqrt3-1}=\frac{(2\sqrt2+3\sqrt3)(5+\sqrt6)}{(5-\sqrt6)(5+\sqrt6)}-\frac{2(\sqrt3+1)}{(\sqrt3-1)(\sqrt3+1)}=\frac{19\sqrt2+19\sqrt3}{19}-\frac{2(\sqrt3+1)}{2}$$

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

ب) $$\frac{3\sqrt3-1}{4+\sqrt3}+\frac{1}{2-\sqrt3}=\frac{(3\sqrt3-1)(4-\sqrt3)}{(4+\sqrt3)(4-\sqrt3)}+\frac{(2+\sqrt3)}{(2-\sqrt3)(2+\sqrt3)}=\frac{13\sqrt3-13}{13}+(2+\sqrt3)$$

$$\sqrt3-1+2+\sqrt3=\boxed{1+2\sqrt3}$$

4

الف) $$\sqrt{\left(\frac{\sqrt{1+\sqrt3}+\sqrt{\sqrt3-1}}{\sqrt{\sqrt3-\sqrt2}}\right)^2}-2=\sqrt{\frac{1+\sqrt3+\sqrt3-1+2\sqrt2}{\sqrt3-\sqrt2}}=\sqrt{\frac{2\sqrt3+2\sqrt2(\sqrt3+\sqrt2)}{\sqrt3-\sqrt2(\sqrt3+\sqrt2)}}$$

$$=\sqrt{2(\sqrt3+\sqrt2)^2}-2=\sqrt2(\sqrt3+\sqrt2)-2=\boxed{\sqrt6}$$

ب) $$2^{\frac{5}{12}}\cdot3\cdot2^{\frac{1}{2}}\cdot2\cdot2^{\frac{1}{12}}=2\times2\times3=12$$

5

$$\frac{3^x(1+3+9+27+81+243)}{2^{x-2}(1+2+4+8+16+32)}=4\left(\frac{3}{2}\right)^x\cdot\left(\frac{364}{63}\right)=52$$

$$\frac{4}{9}\times\left(\frac{3}{2}\right)^x\times52=52$$

$$\frac{4}{9}\times\left(\frac{3}{2}\right)^x=1\Rightarrow\boxed{x=2}$$

$$\frac{4}{9}\cdot\frac{9}{4}=1$$

$(a^2+b^2-2ab)^2(a^2+b^2+2ab)^2 = ((a-b)^2 \cdot (a+b)^2)^2 = (a^2-b^2)^4 =$

$(a^2)^4 - 4(a^2)^3(b^2) + 6(a^2)^2(b^2)^2 - 4(a^2)(b^2)^3 + (b^2)^4$ 6

$(\sqrt6-2)^2 - 4\sqrt2(\sqrt6-2) + 6(\sqrt2)^2 - 4\sqrt2(\sqrt6+2) + (\sqrt6+2)^2 =$

$(6+4-4\sqrt6) - 4\sqrt2(2\sqrt6) + 12 + (6+4+4\sqrt6) =$

$32 - 16\sqrt3 = 16(2-\sqrt3)$

$a+\frac1a = f$ / $(a+\frac1a+\sqrt2)^2(a+\frac1a-\sqrt2)^2 = (f+\sqrt2)^2 \cdot (f-\sqrt2)^2 =$

$(f^2-2)^2 = (a^2+\frac{1}{a^2}+2-2)^2 = (a^2+\frac{1}{a^2})^2 \Rightarrow \left((\sqrt[4]{7-4\sqrt3})^2 + \frac{1}{(\sqrt[4]{7-4\sqrt3})^2}\right)^2$ 7

$\left(2-\sqrt3 + \frac{1}{2-\sqrt3}\right)^2 = \left(\frac{8-4\sqrt3}{2-\sqrt3}\right)^2 = \left(\boxed{4}\right)^2 = 16$

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

$A = \sqrt[5]{4\sqrt[3]{16}}\left(\frac12\right)^{-\frac43} \Rightarrow \sqrt[5]{4\sqrt[3]{16}} = \sqrt[15]{2^{10}} = \sqrt[3]{4}$, $\left(\frac12\right)^{-\frac43} = 2^{\frac43} = \sqrt[3]{16}$ $\Rightarrow \sqrt[3]{64} = 4$

$(2A)^{-\frac13} = 8^{-\frac13} = \left(\frac18\right)^{\frac13} = \boxed{\frac12}$ 8

$\sqrt[7]{a} = 3^3 \times a^{\frac{10}{7}} \Rightarrow a = 3^{21} \times a^{10} \Rightarrow a^9 \cdot 3^{21} = 1 \Rightarrow a^9 = 3^{-21}$

$a^3 = 3^{-7}$

$a = 3^{-\frac73}$ 9

$3^{\frac43} = 3\sqrt[3]{3}$

$\frac{\frac1a - 3}{1+\sqrt3} = \frac{3\sqrt3-3}{1+\sqrt3} \cdot \frac{(1-\sqrt3)}{(1-\sqrt3)} = \frac{6\sqrt3-12}{-2} = \boxed{6-3\sqrt3}$

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

$2A = x+a-x+4-4 = a$

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

$\boxed{A = \frac{a}{2}}$