$$C=(a^2+b^2-2ab)^2(a^2+b^2+2ab)^2=((a-b)^2)^2((a+b)^2)^2=(a-b)^4(a+b)^4=\boxed{(a^2-b^2)^4}$$

$$C=t(2-\sqrt{3}) \Rightarrow (a^2-b^2)^4=t(2-\sqrt{3}) \Rightarrow 16(2-\sqrt{3})=t(2-\sqrt{3}) \Rightarrow \boxed{t=16}$$

$$\left.\begin{array}{l} a^2=\sqrt{\sqrt{6}-2} \\ b^2=\sqrt{\sqrt{6}+2} \end{array}\right\} \Rightarrow \left(\left(\sqrt{\sqrt{6}-2}-\sqrt{\sqrt{6}+2}\right)^2\right)^2=\left(\sqrt{6}-2+\sqrt{6}+2-2\sqrt{\underbrace{(\sqrt{6}-2)(\sqrt{6}+2)}_{6-4=2}}\right)^2= \quad 6$$

$$(2\sqrt{6}-2\sqrt{2})^2=24+8-16\sqrt{3}=32-16\sqrt{3}=16(2-\sqrt{3}) \Rightarrow$$

$$(a^2-b^2)^4=16(2-\sqrt{3})$$

---

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

$$\Rightarrow \left((\sqrt{2-\sqrt{3}})^2+\frac{1}{(\sqrt{2-\sqrt{3}})^2}+2-2\right)^2=\left(2-\sqrt{3}+\frac{1\,(2+\sqrt{3})}{\underbrace{(2-\sqrt{3})(2+\sqrt{3})}_{4-3=1}}\right)^2=(2-\sqrt{3}+2+\sqrt{3})^2 \Rightarrow$$

$$a=\sqrt[4]{7-4\sqrt{3}}=\sqrt[4]{(2-\sqrt{3})^2}=\sqrt{2-\sqrt{3}} \qquad (4)^2=2^t \Rightarrow 2^4=2^t \Rightarrow \boxed{t=4}$$

---

$$A=\sqrt[5]{4\sqrt[3]{16}}\left(\frac{1}{2}\right)^{-\frac{4}{3}}=\sqrt[15]{2^6\times 2^4}\,(2)^{\frac{4}{3}}=2^{\frac{10}{15}=\frac{2}{3}}\times 2^{\frac{4}{3}}=2^{\frac{2+4}{3}}=2^{\frac{6}{3}}=2^2=4 \Rightarrow$$

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

---

$$\sqrt[7]{a}=\underset{\downarrow\, 27}{3^3}\times\sqrt[7]{a^{15}} \Rightarrow \sqrt[7]{\frac{a}{a^{15}}}=3^3 \Rightarrow \frac{1}{a^{14}}=3^{21} \Rightarrow a^{14}=3^{-21} \Rightarrow a^2=3^{-3} \Rightarrow \boxed{a=\sqrt{\frac{1}{27}}}$$

$$B=\frac{1}{a}-3=\frac{1}{\frac{1}{\sqrt{27}}}-3=3\sqrt{3}-3=3(\sqrt{3}-1) \Rightarrow \overset{C}{\boxed{\frac{B}{(1+\sqrt{3})}}}=\frac{3(\sqrt{3}-1)(\sqrt{3}-1)}{(1+\sqrt{3})(\sqrt{3}-1)}=\frac{3(\sqrt{3}-1)^2}{3-1=2} \quad 9$$

$$\Rightarrow C=\frac{3(3+1-2\sqrt{3})}{2}=\frac{3(2(2-\sqrt{3}))}{2}=\underbrace{3(2-\sqrt{3})}_{6-3\sqrt{3}}$$

عبارت $\frac{B}{1+\sqrt{3}}$ برابر با $6-3\sqrt{3}$ است

---

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

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

$$2\sqrt{x+a}+2\sqrt{x-4}-a-4=0 \Rightarrow 2\underbrace{(\sqrt{x+a}+\sqrt{x-4}-2)}_{B}=a \Rightarrow 2B=a \Rightarrow B=\frac{a}{2} \Rightarrow$$

صورت سوال: $\sqrt{x+a}+\sqrt{x-4}-2=\,?=B$ $\qquad \boxed{(\sqrt{x+a}+\sqrt{x-4}-2)=\frac{a}{2}}$

نام و نام خانوادگی امیربابک عادلجو ............ پاسخنامه تشریحی تکلیف شماره ۲۱ کلاس دهم - B ریاضی

**۱**

$1!=1$

$1!+3!=\boxed{7}$

$1!+3!+5!=12\boxed{7}$

$1!+3!+5!+7!=516\boxed{7}$

$1!+3!+5!+7!+9!=37396\boxed{7}$

نکته: دلیل اصلی این اتفاق این است که از ۵! به بعد عامل‌های ۲ و ۵ را داریم که باعث تشکیل 10 و صفر در یکان می‌شود؛ پس از ۵! به بعد یکان خود تغییری نمی‌کند

$2!=2$

$2!+4!=2\boxed{6}$

$2!+4!+6!=74\boxed{6}$

$2!+4!+6!+8!=4106\boxed{6}$

$2!+4!+6!+8!+10!=366986\boxed{6}$

دلیل این هم مانند نکته قبل است ⇐

۳ = رقم یکان عبارت ← ۲ $=\ldots 42=(\ldots 6)\times(\ldots 7)$

**۲**

الف) $\sqrt[4]{\frac{1\times(4-\sqrt7)}{(4+\sqrt7)\times(4-\sqrt7)}}\times\underbrace{\sqrt{1+\sqrt7}}=\sqrt[4]{\frac{(4-\sqrt7)(1+\sqrt7)^2}{\underbrace{(16-7)}_{9}}}=\sqrt[4]{\frac{(4-\sqrt7)\,(4+\sqrt7)2}{9}}=\sqrt[4]{\frac{(16-7)2}{\cancel{9}}}=\boxed{\sqrt[4]{2}}$

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

ب) $\left(\underbrace{\frac{\sqrt2+\sqrt5}{\sqrt{10}+2}}_{x_1}\right)\left(\underbrace{\sqrt{3-\sqrt5}-\sqrt{3+\sqrt5}}_{x_2}\right)\Rightarrow x_1=\frac{\sqrt2+\sqrt5}{(\sqrt2\times\sqrt5)+(\sqrt2\times\sqrt2)}=\frac{\cancel{\sqrt2+\sqrt5}}{\sqrt2(\cancel{\sqrt2+\sqrt5})}\Rightarrow x_1=\frac{1}{\sqrt2}$

$\sqrt{A\pm\sqrt B}=\sqrt{\frac{A+\sqrt{A^2-B}}{2}}\pm\sqrt{\frac{A-\sqrt{A^2-B}}{2}}$ ، $A=3,\ B=5$

$x_2=\sqrt{\frac{3+\sqrt4}{2}}-\sqrt{\frac{3-\sqrt4}{2}}=\sqrt{\frac52}-\sqrt{\frac12}\Rightarrow x_2=\sqrt{\frac52}-\sqrt{\frac12}$ ، $x_1=\sqrt{\frac52}+\sqrt{\frac12}$

$\left(\frac{1}{\sqrt2}\right)\left(\sqrt{\frac52}-\sqrt{\frac12}-\sqrt{\frac52}-\sqrt{\frac12}\right)=\frac{1}{\sqrt2}\times\frac{-2}{\sqrt2}=\boxed{-1}$

**۳**

الف) $\frac{(2\sqrt2+3\sqrt3)(5+\sqrt6)}{(5-\sqrt6)(5+\sqrt6)}-2(\sqrt3-1)^{-1}=\frac{10\sqrt2+15\sqrt3+9\sqrt2+4\sqrt3}{\underbrace{(25-6)}_{19}}-\frac{2(\sqrt3+1)}{(\sqrt3-1)(\sqrt3+1)}=\frac{\cancel{19}(\sqrt2+\sqrt3)}{\cancel{19}}-\frac{\cancel{2}(\sqrt3+1)}{\cancel{2}}$

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

قسمت ب سوال ۳

$\frac{(3\sqrt3-1)(4-\sqrt3)}{(4+\sqrt3)(4-\sqrt3)}+\frac{1\times(2+\sqrt3)}{(2-\sqrt3)(2+\sqrt3)}=x_1$

$x_1=\frac{-13+13\sqrt3}{13}+(2+\sqrt3)=\sqrt3-1+2+\sqrt3=\boxed{2\sqrt3+1}$ → جواب نهایی

**۴**

قسمت الف سوال ۴

$\underbrace{\frac{\sqrt{1+\sqrt3}+\sqrt{\sqrt3-1}}{\sqrt{\sqrt3-\sqrt2}}}_{A}-2=A-2=$

$A^2=\frac{1+\sqrt3+\sqrt3-1+2\sqrt{(\sqrt3-1)(\sqrt3+1)}}{(\sqrt3-\sqrt2)(\sqrt3+\sqrt2)}(\sqrt3+\sqrt2)\Rightarrow$

$A^2=\frac{(2\sqrt3+2\sqrt2)(\sqrt3+\sqrt2)}{3-2}=\frac{2(\sqrt3+\sqrt2)^2}{1}\Rightarrow$

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

$\sqrt6+2-2=\boxed{\sqrt6}$

قسمت ب سوال ۴

$\underbrace{2^{\frac{5}{12}}}_{\sqrt[4]{\sqrt[3]{2^5}}}\times\underbrace{(3^4\times2)^{\frac14}}_{\sqrt[4]{162}}\times(2^{12}\times2)^{\frac{1}{12}}=2^{\frac{5+13}{12}}\times3^{\frac44}=2^2\times3=12$

$\sqrt[4]{\sqrt[3]{2^?}}$

جواب نهایی: $12=2^2\times3$

**۵**

$\frac{3^x\left(1+3^1+\overset{9}{3^2}+\overset{27}{3^3}+\overset{81}{3^4}+\overset{243}{3^5}\right)}{2^{x-2}\left(1+2^1+\underset{4}{2^2}+\underset{8}{2^3}+\underset{16}{2^4}+\underset{32}{2^5}\right)}=\frac{3^x(1+3+9+27+81+243)2^2}{2^x(1+2+4+8+16+32)}=\frac{3^x\times364\times4}{2^x\times63}=52\Rightarrow$

$2^{x-2}=\frac{2^x}{2^2}$

$\left(\frac32\right)^x\times\frac{\cancel{364}^{7}\times4}{63}=\cancel{52}^{1}\Rightarrow\left(\frac32\right)^x=\frac{\cancel{63}^{9}}{\cancel{28}_{4}}=\left(\frac32\right)^2\Rightarrow\boxed{x=2}$

جواب نهایی: $\boxed{x=2}$