① $(\ldots) + 14|0 + 2|0$ بقیه عامل ۲ و ۵ دارند. $\times$ $(00) + 3|0 + 1|0$ بقیه عامل ۲ و ۵ دارند.

$2 + 24 = 26$

$1 + 6 = 7$

$26 \times 7 = 182$ رقم‌های عبارت $= \boxed{2}$

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② الف)
$$\frac{(1+\sqrt{7})^{\frac{1}{2}}}{(4+\sqrt{7})^{\frac{1}{4}}} = \frac{(1+7+2\sqrt{7})^{\frac{1}{4}}}{(4+\sqrt{7})^{\frac{1}{4}}} = \left(\frac{8+2\sqrt{7}}{4+\sqrt{7}}\right)^{\frac{1}{4}} = 2^{\frac{1}{4}} = \boxed{\sqrt[4]{2}}$$

ب) اول مقدار مربع
$$\left(\sqrt{3-\sqrt{5}} - \sqrt{3+\sqrt{5}}\right)^2 = (3-\sqrt{5}) + (3+\sqrt{5}) - 2\underbrace{\sqrt{9-5}}_{\sqrt{4}=2} = 6-2(2) = 2$$

پس ← $\sqrt{3-\sqrt{5}} - \sqrt{3+\sqrt{5}} = -\sqrt{2}$

$$\frac{\sqrt{2}+\sqrt{5}}{\sqrt{10}+2} \times (-\sqrt{2}) = \frac{-2-\sqrt{10}}{\sqrt{10}+2} = \boxed{-1}$$

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③ الف)
$$\frac{2\sqrt{2}+3\sqrt{3}}{5-\sqrt{6}} \times \frac{5+\sqrt{6}}{5+\sqrt{6}} = \frac{10\sqrt{2}+15\sqrt{3}+2\overset{4\sqrt{3}}{\sqrt{12}}+3\overset{9\sqrt{2}}{\sqrt{18}}}{\underbrace{25-6}_{19}} = \frac{19\sqrt{3}+19\sqrt{2}}{19} = \sqrt{3}+\sqrt{2}$$

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

$$\sqrt{3}+\sqrt{2}-\sqrt{3}-1 = \boxed{\sqrt{2}-1}$$

ب)
$$\frac{3\sqrt{3}-1}{4+\sqrt{3}} \times \frac{4-\sqrt{3}}{4-\sqrt{3}} = \frac{12\sqrt{3}-4-9+\sqrt{3}}{\underbrace{16-3}_{13}} = \frac{13\sqrt{3}-13}{13} = \sqrt{3}-1$$

$$\frac{1}{2-\sqrt{3}} \times \frac{2+\sqrt{3}}{2+\sqrt{3}} = \frac{2+\sqrt{3}}{\cancel{4-3}} = 2+\sqrt{3}$$

$$\sqrt{3}-1+2+\sqrt{3} = \boxed{2\sqrt{3}+1}$$

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④ الف)
$$\frac{\left(\sqrt{1+\sqrt{3}}+\sqrt{\sqrt{3}-1}\right)^2}{\sqrt{3}-\sqrt{2}} = \frac{2\sqrt{3}+2\sqrt{3-1}}{\sqrt{3}-\sqrt{2}} = \frac{2(\sqrt{3}+\sqrt{2})}{\sqrt{3}-\sqrt{2}} \times \frac{\sqrt{3}+\sqrt{2}}{\sqrt{3}+\sqrt{2}}$$

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

ب)
$$2^{\frac{2}{3}} \times 3 \times 2^{\frac{3}{4}} \times 2^{1} \times 2^{\frac{1}{12}} = 2^{2} \times 3 = 4 \times 3 = \boxed{12}$$

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$$\frac{3^x(\overbrace{1+3+9+\dots+243}^{364})}{2^x(\underbrace{\frac{1}{4}+\frac{1}{2}+1+2+\dots+8}_{\frac{63}{4}})} = 52 \longrightarrow \frac{3^x}{2^x} = \frac{52}{\frac{1456}{63}} = \frac{225}{100} = \frac{9}{4}$$

$$\boxed{x=2}$$

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$$\underbrace{(a-b)^4}_{(2^{\frac{5}{4}})^4=\boxed{2^5}}\ \underbrace{(a+b)^4}_{\boxed{6^{\frac12}\times 2^4}} = \longrightarrow \sqrt{6}\times 2^9 = 2t - \sqrt{3}t$$

$$6^{\frac18} + 2^{\frac14} - 6^{\frac18} + 2^{\frac14}$$

$$6^{\frac18} + \cancel{2^{\frac14}} + 6^{\frac18} + \cancel{2^{\frac14}} = 6^{\frac18}\times 2 =$$

$$\frac{2+\sqrt3}{2+\sqrt3}\times\frac{\overbrace{\sqrt2\times\sqrt3}^{\sqrt6}\times 2^9}{2-\sqrt3} = t$$

$$t = \frac{2^{10}\sqrt6 + 2^9\sqrt{18}}{4-3=1} = \boxed{2^9(\sqrt{24}+\sqrt{18})}$$

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$$(\underbrace{a+\frac1a}_{x}+\sqrt2)^2(\underbrace{a+\frac1a}_{x}-\sqrt2)^2 = (x^2-2)^2 \longrightarrow (a^2+\frac{1}{a^2})^2 = (2-\sqrt3+\frac{1}{2-\sqrt3})^2 =$$

$$a=\sqrt[4]{7-4\sqrt3} = a=\sqrt{2-\sqrt3}$$

$$\left(\frac{8-4\sqrt3}{2-\sqrt3}\right)^2 = 4^2 = 2^4 = 2^t$$

$$\boxed{t=4}$$

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$$2^{\frac25}\times 2^{\frac{4}{15}}\times 2^{\frac43} = 2^{\frac{20+4+6}{15}} = 2^2 = 4 = A$$

$$(2^3)^{-\frac13} = 2^{-1} = \boxed{\frac12}$$

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$$a^{\frac17} = 3^3\times a^{\frac{15}{7}} = a^{\frac17}\times a^{-\frac{15}{7}} = a^{-\frac{14}{7}} = a^{-2} = 3^3$$

$$(a^{-2})^{-\frac12} = (3^3)^{-\frac12} \Rightarrow a = 3^{-\frac32}$$

$$\frac{\left(\frac{1}{\frac{1}{3^{\frac32}}}-3\right)}{1+\sqrt3} = 3^{\frac32}-3 = 3(3^{\frac12}-1) \Rightarrow \frac{3(\sqrt3-1)}{(1+\sqrt3)}\times\frac{(\sqrt3-1)}{(\sqrt3-1)} = \boxed{\frac{3(3+1-2\sqrt3)}{2}}$$

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$$\sqrt{x+a} - \sqrt{x-4} = 2 \longrightarrow \cancel{x^{\frac{1}{2}}} + a^{\frac{1}{2}} - \cancel{x^{\frac{1}{2}}} + \cancel{4^{\frac{1}{2}}} = \cancel{2}$$

$\boxed{a = 4}$ در این صورت

$x = 5$ میشه

$$\underset{\sqrt{9}}{\sqrt{\cancel{4+5}}} + \underset{1}{\sqrt{\cancel{5-4}}} - 2 = 3 - 1 = \boxed{2}$$