

دوم دختر A

$$\underbrace{(1^2 + 3^2 + 5^2 + \dots)}_{\text{رقم یکان}} \underbrace{(2^2 + 4^2 + \dots)}_{\text{رقم یکان}} = 1 \times 4 = 4 \rightarrow 2 \leftarrow \text{رقم یکان}$$

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الف) $\sqrt[k]{(k+\sqrt{v})^{-1}(1+\sqrt{v})^v} = \sqrt[k]{\frac{1+2\sqrt{v}}{k+\sqrt{v}}} = \sqrt[k]{\frac{v(k+\sqrt{v})}{(k+\sqrt{v})}} = \sqrt[k]{v}$

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ب) $\left(\frac{\sqrt{2}+\sqrt{5}}{\sqrt{10}+2}\right) = \frac{\sqrt{2}+\sqrt{5}}{\sqrt{2}(\sqrt{5}+\sqrt{2})} = \frac{1}{\sqrt{2}}$

$$\sqrt{3-\sqrt{5}} - \sqrt{3+\sqrt{5}} = \sqrt{\frac{(1-\sqrt{5})^2}{4}} - \sqrt{\frac{(1+\sqrt{5})^2}{4}} =$$

$$\frac{\sqrt{(1-\sqrt{5})^2}}{\sqrt{4}} - \frac{\sqrt{(1+\sqrt{5})^2}}{\sqrt{4}} = \frac{\sqrt{5}-1}{2} - \frac{1+\sqrt{5}}{2} = \frac{-2}{2} = -1$$

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الف) $\frac{\sqrt{11}+\sqrt{27}}{5-\sqrt{6}} - \frac{2}{\sqrt{3}-1}$

$$A = \frac{\sqrt{11}+\sqrt{27}}{5-\sqrt{6}} \times \frac{5+\sqrt{6}}{5+\sqrt{6}} = \frac{5\sqrt{11}+5\sqrt{27}+\sqrt{61}+\sqrt{142}}{25-6} = \frac{10\sqrt{11}+15\sqrt{3}+9\sqrt{2}}{19} = \sqrt{3}+\sqrt{2}$$

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

$$A-B = \sqrt{2}-1$$

ب) $\frac{\sqrt{27}-1}{k+\sqrt{3}} - \frac{1}{2-\sqrt{3}}$

$$A = \frac{3\sqrt{3}-1}{k+\sqrt{3}} \times \frac{k-\sqrt{3}}{k-\sqrt{3}} = \frac{12\sqrt{3}-k-9+\sqrt{3}}{13} = \sqrt{3}-1$$

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

$$A-B = 1+2\sqrt{3}$$

الف) $A = \sqrt{1+\sqrt{3}} + \sqrt{\sqrt{3}-1}$ $A^2 = (\sqrt{1+\sqrt{3}})^2 + (\sqrt{\sqrt{3}-1})^2 + 2(1+\sqrt{3})(\sqrt{3}-1) = 2\sqrt{3}+2\sqrt{2}$

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$A = \sqrt{2\sqrt{3}+2\sqrt{2}}$

مخرج $\rightarrow B = \sqrt{\sqrt{3}-\sqrt{2}}$ $\frac{A}{B} = \sqrt{\frac{2\sqrt{3}+2\sqrt{2}}{\sqrt{3}-\sqrt{2}}} \xrightarrow{\text{کوب کردن}} \sqrt{\frac{2\sqrt{3}+2\sqrt{2}}{\sqrt{3}-\sqrt{2}}} \times \frac{\sqrt{3}+\sqrt{2}}{\sqrt{3}+\sqrt{2}} = \frac{\sqrt{10+4\sqrt{6}}}{1} = \sqrt{(2+\sqrt{6})^2} = 2+\sqrt{6}$

عبارت $= 2+\sqrt{6} - 2 = \sqrt{6}$

ب) $12\sqrt{28} \times \sqrt[4]{11 \times 2} \times \sqrt[12]{21 \times 2} = \sqrt[12]{2^{11}} \times \sqrt[3]{2} = \sqrt[12]{2^{13}} = 2 \times 2 = 4$

$$\frac{2^x (1 + 2^1 + 2^2 + 2^3 + 2^4 + 2^5)}{2^{x-2} (1 + 2 + 2^2 + 2^3 + 2^4 + 2^5)} = 52 \rightarrow \frac{2^x}{2^{x-2}} \times 34 = 52 \times 52 \rightarrow \frac{2^x}{2^{x-2}} = 9$$

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$\rightarrow x=2$
با سه جواب درست در می آید

$$(a-b)^r \times (a+b)^r = (a^2-b^2)^r$$

$$\left(\sqrt{4+r} - \sqrt{4-r} \right)^2 = (\sqrt{4} + \sqrt{r} - \sqrt{4} - \sqrt{r})^2 = (\sqrt{4} + \sqrt{r} - \sqrt{4} - \sqrt{r})^2 = 4(4+r-4\sqrt{r}) = 4(4-r-4\sqrt{r}) =$$

$$14(4-\sqrt{r}) \rightarrow 14$$

$$\xrightarrow{\text{Expanding}} \left(\left(a + \frac{1}{a} \right)^2 - r \right)^2 = \left(a^2 + \frac{1}{a^2} + 2 - r \right)^2 = a^4 + \frac{1}{a^4} + 2$$

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$$= 4 - 4\sqrt{r} + \frac{1}{4 - 4\sqrt{r}} + 2 = 9 - 4\sqrt{r} + \frac{1 + 4\sqrt{r}}{4 - 4\sqrt{r}} = 14$$

$$A = \sqrt{4\sqrt{14}} \left(\frac{1}{r} \right)^{\frac{r}{2}} = \sqrt{4^r \times r^{\frac{r}{2}}} \times r^{\frac{r}{2}} = \sqrt{4^r \frac{1}{r}} \times r^{\frac{r}{2}} = 4^{\frac{r}{2}} \times r^{\frac{r}{2}} = 2^r \times r^{\frac{r}{2}}$$

-A

$$(2A)^{-\frac{1}{r}} = 2^{-\frac{1}{r}} = 0.5$$

$$\sqrt[r]{a} = rV \times a^{\frac{1}{V}} \xrightarrow{\div \sqrt[r]{a}} 1 = rV \times \frac{a^{\frac{1}{V}}}{a^{\frac{1}{V}}} \Rightarrow 1 = rV a^r \rightarrow a^r = \frac{1}{rV} \rightarrow a = \frac{1}{r\sqrt[r]{r}}$$

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$$\frac{\left(\frac{1}{a} - r \right)}{(1 + \sqrt{r})} = \frac{4\sqrt{r} - r}{1 + \sqrt{r}} \times \frac{1 - \sqrt{r}}{1 - \sqrt{r}} = \frac{4\sqrt{r} - 4 - r + r\sqrt{r}}{1 - r} = \frac{4\sqrt{r} - 4}{-r} = -4\sqrt{r} + 4$$

$$\underbrace{\sqrt{x+a}}_M - \underbrace{\sqrt{x-r}}_N = r$$

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$$\sqrt{x+a} + \sqrt{x-r} - r = ?$$

$$M - N = r$$

$$M + N - (M - N) = 2N = r(\sqrt{x-r})$$