

11, 5

بواب ریاضی

$$(1! + 2!)(2! + 4!) = (1 + 2)(2 + 24) = 182$$

(2)

رقم یکان = 2

$$(4 + \sqrt{7})^{\frac{1}{4}} (1 + \sqrt{7})^{\frac{1}{4}} \quad 1 + \sqrt{7} = \frac{4 + \sqrt{7}}{4 - \sqrt{7}} = \frac{(4 + \sqrt{7})^2}{16 - 7} = \frac{22 + 8\sqrt{7}}{9}$$

$$(4 + \sqrt{7})^{\frac{1}{4}} \times (4 + \sqrt{7})^{\frac{1}{4}} = \boxed{1}$$

$$\frac{\sqrt{2} + \sqrt{3}}{\sqrt{2}(\sqrt{3} + \sqrt{2})} \left(\frac{3 - \sqrt{3} - 3 - \sqrt{3}}{\sqrt{3} - \sqrt{3} + \sqrt{2} + \sqrt{3}} \right) = \frac{1}{\sqrt{2}} \left(\frac{2\sqrt{3}}{-\sqrt{2}} \right) = \boxed{-1}$$

$$\sqrt{3 - \sqrt{5}} - \sqrt{3 + \sqrt{5}} = b \rightarrow b^2 = 4 - 2\sqrt{5} = 2 \rightarrow b = -\sqrt{2}$$

$$\frac{\sqrt{8 + 2\sqrt{7}}}{2 - \sqrt{7}} = \frac{2^{\frac{5}{2}} + 2^{\frac{3}{2}}}{2 - \sqrt{7}} \quad 2(\sqrt{9} - 1)^{-1} = \frac{2}{\sqrt{9} - 1}$$

$$\sqrt{8 + 2\sqrt{7}} = \sqrt{8 - 2\sqrt{7}} \Rightarrow \sqrt{8 - 2\sqrt{7}} - \sqrt{8 + 2\sqrt{7}} = -2$$

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

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

$$= 2\sqrt{(1 + \sqrt{2})(\sqrt{2} - 1)} + 2\sqrt{2} \Rightarrow (1 + \sqrt{2})(\sqrt{2} - 1) = 2$$

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

$$\sqrt[4]{16} = (2^4)^{\frac{1}{4}} = 2^{\frac{4}{4}} = 2^1 = 2$$

$$\sqrt[4]{16} = (2 \times 2^{\frac{1}{2}})^{\frac{1}{4}} = 2^{\frac{5}{12}}$$

$$2^{\frac{1}{12}} \times 2^{\frac{3}{12}} \times 2^{\frac{5}{12}} \times 2 = 2^2 \times 2 = \boxed{12}$$

$$\frac{r^{2n}(1+r+r^2+\dots+r^{n-1})}{r^{2n}(1+r+r^2+\dots+r^{n-1})} = \frac{r^{2n} \times \frac{1-r^n}{1-r}}{r^{2n} \times \frac{1-r^n}{1-r}} = \frac{r^{2n}}{r^{2n}} \times \frac{1}{1-r} = \frac{1}{1-r}$$

$$\Rightarrow r^{2n} = 9 \times r^{2n-2} \Rightarrow r^{2n-2} = r^{2n-2} \Rightarrow \boxed{n=2} \checkmark$$

$$(a-b)^r(a+b)^r = (a^r-b^r)^r = t(r-\sqrt{r}) = \sqrt{r+2} + \sqrt{r-2} - \sqrt{r-2} \quad (5)$$

$$t(r-\sqrt{r}) = \sqrt{r+2} \quad t = \frac{\sqrt{r+2}}{r-\sqrt{r}}$$

$$(K+\sqrt{r})^r(K-\sqrt{r})^r = (K^r-r)^r = (a^r+\frac{1}{a^r})^r, a^r = \sqrt{r-\sqrt{r}}^r \quad \boxed{a+\frac{1}{a}=K} \checkmark$$

$$\Rightarrow r-\sqrt{r} + \frac{1}{r-\sqrt{r}} = \frac{1-\varepsilon\sqrt{r}}{r-\sqrt{r}} = \frac{\varepsilon(r-\sqrt{r})}{r-\sqrt{r}} \quad \varepsilon^r = r^t \Rightarrow t = \varepsilon \checkmark$$

$$\varepsilon \times \sqrt[10]{16} = r^r \times r^{\frac{\varepsilon}{r}} = r^{\frac{1}{10}} \Rightarrow \sqrt[10]{r^{\frac{1}{10}}} = r^{\frac{r}{10}}$$

$$\left(\frac{1}{r}\right)^{-\frac{\varepsilon}{r}} = r^{\frac{\varepsilon}{r}} \Rightarrow r^{\frac{\varepsilon}{r}} \times r^{\frac{\varepsilon}{r}} = r^r = \varepsilon \Rightarrow A = \varepsilon \checkmark \quad (rA)^{-\frac{1}{r}} = \frac{1}{r}$$

$$\frac{a^{\frac{1}{10}}}{a^{\frac{1}{10}}} = r^r \Rightarrow a^{\frac{1-r}{10}} = r^r \Rightarrow a = \frac{1}{r^{\frac{r}{1-r}}}$$

$$\frac{1}{a} - r = r\sqrt{r} - r = r(\sqrt{r}-1) \quad \frac{r(\sqrt{r}-1)}{\sqrt{r}+1} = \frac{r(r+1-r\sqrt{r})}{\varepsilon} \quad (9)$$

$$\frac{r(\sqrt{r}-1)}{\sqrt{r}+1} \times \frac{\sqrt{r}-1}{\sqrt{r}-1} = \frac{r(r+1-r\sqrt{r})}{r-1} = \boxed{4-3\sqrt{3}} \quad \frac{12-6\sqrt{3}}{\varepsilon} = \frac{4-3\sqrt{3}}{r}$$

$$\sqrt{n+a} + \sqrt{n-\varepsilon} - 2 = \cancel{r} + 2\sqrt{n-\varepsilon} - \cancel{r} = 2\sqrt{n-\varepsilon} \quad \underline{0} \quad (10)$$

دو عبارت داده شده زوج یکدیگرند:

$$(\sqrt{n+a} + \sqrt{n-\varepsilon})(\sqrt{n+a} - \sqrt{n-\varepsilon}) = (n+a) - (n-\varepsilon) = a+\varepsilon$$

$$(\sqrt{n+a} + \sqrt{n-\varepsilon}) \times r = a+\varepsilon \rightarrow \sqrt{n+a} + \sqrt{n-\varepsilon} - 2 = \frac{a+\varepsilon}{r} - 2 = \boxed{\frac{a}{r}}$$

$$(4 + \sqrt{5})^{-1} = \frac{1}{4 + \sqrt{5}} \times \frac{4 - \sqrt{5}}{4 - \sqrt{5}} = \frac{4 - \sqrt{5}}{9} = \frac{8 - 2\sqrt{5}}{18} = \frac{(1 - \sqrt{5})^2}{18}$$

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صورت فعال $\rightarrow \left[\frac{(1 - \sqrt{5})^2}{18} \times \sqrt{1 + \sqrt{5}} \right] = \frac{\sqrt{1 - \sqrt{5}} \sqrt{1 + \sqrt{5}}}{\sqrt{18}} = \frac{\sqrt{4}}{\sqrt{18}} = \boxed{\sqrt[4]{2}}$

$$\frac{\sqrt{8} + \sqrt{27}}{5 - \sqrt{4}} = \frac{2\sqrt{2} + 3\sqrt{3}}{5 - \sqrt{4}} \times \frac{5 + \sqrt{4}}{5 + \sqrt{4}} = \sqrt{2} + \sqrt{3}$$

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$$\rightarrow \sqrt{2} + \sqrt{3} - 2\left(\frac{1}{4}(\sqrt{3} + 1)\right)$$

$$(\sqrt[4]{9} - 1)^{-1} = \frac{1}{\sqrt[4]{9} - 1} \times \frac{\sqrt[4]{9} + 1}{\sqrt[4]{9} + 1} = \frac{1}{4}(\sqrt{3} + 1)$$

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

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

$$\rightarrow \text{جواب} = 2\sqrt{3} + 1$$

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

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

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$$A^T = 2\sqrt{3} + 2\sqrt{2} \rightarrow A = \sqrt{2}(\sqrt{\sqrt{3} + \sqrt{2}})$$

$$\sqrt{2} \sqrt{(\sqrt{3} + \sqrt{2})^2} - 2 = \sqrt{2} + 2 - 2 = \boxed{\sqrt{4}}$$

توضيح!

$$(a-b)^5 (a+b)^5 = (a^5 - b^5) = (\sqrt{5-2} - \sqrt{5+2})^5 \quad -4$$

$$(\sqrt{5-2} + \sqrt{5+2} - 2\sqrt{(\sqrt{5-2})(\sqrt{5+2})})^5 = (2\sqrt{5} - 2\sqrt{2})^5 = 14(2-\sqrt{2})$$