

امین خالوی دهم الف

سؤال ۱

$$\frac{24}{(1! \cdot 3!) (2! \cdot 3!)} = 18 \Rightarrow \frac{24}{18} = \frac{4}{3}$$

مابقی عوامل نمر شده یکن صفر دند چون در این اعداد عامل دو و پنج وجود دارد

سؤال ۲

$$\sqrt[3]{\frac{1}{4+\sqrt{7}} \times (1+\sqrt{7})^2} = \sqrt[3]{\frac{1}{4+\sqrt{7}} \times (1+2\sqrt{7})} = \sqrt[3]{2}$$

الف

$$\frac{(3\sqrt{3}-1)(2-\sqrt{3})+4+\sqrt{3}}{(4+\sqrt{3})(2-\sqrt{3})} \Rightarrow \frac{8\sqrt{3}-7}{8-2\sqrt{3}} \times \frac{8+2\sqrt{3}}{8+2\sqrt{3}} \Rightarrow \frac{13+24\sqrt{3}}{13} \Rightarrow 1+2\sqrt{3}$$

ب
سؤال ۳ قسمت ۱

سؤال ۴

$$\frac{(\sqrt{1+\sqrt{3}} + \sqrt{\sqrt{3}-1})^2}{\sqrt{\sqrt{3}-\sqrt{2}}} = (\alpha+2)^2 \Rightarrow \frac{2(\sqrt{3}+\sqrt{2})}{\sqrt{3}-\sqrt{2}} \times \frac{\sqrt{3}+\sqrt{2}}{\sqrt{3}+\sqrt{2}} = \frac{2(8+2\sqrt{6})}{1} \Rightarrow 16+4\sqrt{6} = (\alpha+2)^2 \Rightarrow (2+\sqrt{6})^2 = (\alpha+2)^2 \Rightarrow \alpha = \sqrt{6}$$

$$\sqrt[3]{2^2} \times \sqrt[4]{3^4 \times 2} \times \sqrt[12]{2} \Rightarrow \sqrt[3]{2^2} \times \sqrt[4]{2^4 \times 3^4} \times \sqrt[12]{2} \Rightarrow \sqrt[3]{2^2} \times \sqrt[4]{2^4 \times 3^4} \times \sqrt[12]{2} \Rightarrow 2 \times 3 \times 2 \Rightarrow 12$$

سؤال ۳

$$\frac{2\sqrt{2}+3\sqrt{3}}{8-\sqrt{6}} - \frac{2}{\sqrt{3}-1} \Rightarrow \frac{(2\sqrt{2}+3\sqrt{3})(8+\sqrt{6})}{19} - \sqrt{3}-1 \Rightarrow \frac{19\sqrt{2}+19\sqrt{3}}{19} - \sqrt{3}-1 = \sqrt{2}-1$$

الف

سؤال ۲ قسمت ب

$$\frac{(\sqrt{2}+\sqrt{8})^2}{(\sqrt{10}+2)^2} \times (\sqrt{3}-\sqrt{8}-\sqrt{3}+\sqrt{8}) \Rightarrow \frac{7+2\sqrt{10}}{14+4\sqrt{10}} \times ((3-\sqrt{8}+3+\sqrt{8})-2\sqrt{4}) \Rightarrow \frac{1}{4} \times 2 \Rightarrow 1 \xrightarrow{\frac{1}{2}} \frac{1}{2}$$

سؤال ۵

$$\frac{3^x(3^0+3^1+3^2+3^3+3^4+3^5)}{2^x(2^{-2}+2^{-1}+2^0+2^1+2^2+2^3)} = 82 \simeq (1/8)^x = \frac{82}{2^3} \Rightarrow x=2$$

خیلی غیر رند

$$\begin{aligned} (a-b)^2(a+b)^2 &\Rightarrow (a^2-b^2)^2 \rightarrow ((\sqrt{4-2}-\sqrt{4+2}))^2 \rightarrow \sqrt{4-2}+\sqrt{4+2}-2\sqrt{2} \rightarrow (\sqrt{4-2}-\sqrt{4+2})^2 \\ (\sqrt{4-2})(\sqrt{4+2})^2 &\Rightarrow 8(3+1-2\sqrt{3}) \rightarrow 8(4-2\sqrt{3}) \rightarrow 14(2-\sqrt{3}) = t(2-\sqrt{3}) \rightarrow t=14 \end{aligned}$$

$$a = \sqrt[r]{(r - \sqrt{r})^r} \Rightarrow a = \sqrt[r]{r - \sqrt{r}}$$

(٧/١٣)

$$\left(\left(a + \frac{1}{a} + \sqrt{r} \right) \left(a + \frac{1}{a} - \sqrt{r} \right) \right)^r \Rightarrow \left(a + \frac{1}{a} \right)^r - r \rightarrow \left(\frac{1}{a^r} + a^r \right)^r \Rightarrow a^r + \frac{1}{a^r} + r \Rightarrow$$

$$(r - \sqrt{r})^r + \frac{1}{(r - \sqrt{r})^r} + r \Rightarrow r - r\sqrt{r} + \frac{1}{r - r\sqrt{r}} \times \frac{r + r\sqrt{r}}{r + r\sqrt{r}} + r \Rightarrow 14 \Rightarrow r^r = r^t \Rightarrow t = r$$

$$\sqrt[r]{r^4 \times r^r} \times \sqrt[r]{r^{r \times r}} \rightarrow \sqrt[r]{r^{r^2} \times r^{r^2}} \rightarrow \underline{A = r}$$

(٨/١٣)

$$\Lambda^{-\frac{1}{r}} \rightarrow r^{-1} \rightarrow \frac{1}{r}$$

$$\sqrt[r]{a} = r^r \times a^{\frac{1}{r}} \rightarrow a^{-r} = r^r \rightarrow \frac{1}{a^r} = r^r \rightarrow a^r = \frac{1}{r^r} \Rightarrow a = \frac{1}{r^r} \times \frac{\sqrt{r}}{\sqrt{r}} = \frac{\sqrt{r}}{r}$$

(٩/١٣)

$$\frac{\frac{9}{\sqrt{r}} - r}{1 + \sqrt{r}} = \frac{\frac{9}{\sqrt{r}} \times \frac{\sqrt{r}}{\sqrt{r}}}{1 + \sqrt{r}} \rightarrow \frac{r\sqrt{r} - r}{1 + \sqrt{r}} \Rightarrow \frac{r(\sqrt{r} - 1)}{1 + \sqrt{r}} \times \frac{\sqrt{r} - 1}{-1 + \sqrt{r}} = \frac{r(\sqrt{r} - 1)^2}{-r} \Rightarrow \frac{r(r - 2\sqrt{r})}{-r} \Rightarrow \frac{9(r - \sqrt{r})}{-r}$$

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

$$(\sqrt{x+a} - \sqrt{x-r})(\sqrt{x+a} + \sqrt{x-r}) = r(\sqrt{x+a} + \sqrt{x-r})$$

(١٠/١٣)

$$x+a - x+r = r(\sqrt{x+a} + \sqrt{x-r}) \rightarrow \sqrt{x+a} + \sqrt{x-r} = \frac{a+r}{r} \Rightarrow \sqrt{x+a} + \sqrt{x-r} = \frac{a}{r} + r$$

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