

۲۱ طبقه

مثال: $1 \times 2 \times 3 \times \dots \times n = n!$ $\frac{n!}{1}$

$$\underbrace{(1! + 3! + \dots + r!)}_{1 + 9 = V} \underbrace{(1! + 3! + \dots + r!)}_{1 + 9 = V} \quad \text{سوال 1}$$

از بعد از: ω به بعد یکان ω است $\Rightarrow$ یکان عدد $(2) = 2$ $\Rightarrow V \times Y = 42$

سوال (۲)

[illegible]

$$\therefore \frac{\sqrt{r} + \sqrt{a}}{\sqrt{10} + r} \left(\underbrace{\sqrt{r} - \sqrt{a} - \sqrt{r} + \sqrt{a}}_{=0} \right)$$

$$A^r = r - \cancel{\sqrt{a}} + r + \cancel{\sqrt{a}} - r \sqrt{\frac{9-a}{f \cdot a}} = 4 - r = r$$

$$\Rightarrow A = \sqrt{r}$$

$$\frac{\sqrt{p} + \sqrt{a}}{\sqrt{10} + r} (\sqrt{10} - r) = \frac{\cancel{r\sqrt{10}} - r\sqrt{r} + a\sqrt{r} - \cancel{r\sqrt{a}}}{10 - r} = \frac{r\sqrt{r}}{10 - r}$$

$$\frac{\sqrt{r}}{r} \times \sqrt{r} = 1$$

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الف) $\left(\frac{\sqrt{1+\sqrt{3}} + \sqrt{\sqrt{3}-1}}{\sqrt{\sqrt{3}-\sqrt{2}}} \right)^2 - 1 = A^2 - 1 \Rightarrow \frac{1+\sqrt{3} + \sqrt{3}-1 + 2\sqrt{3}-1}{\sqrt{3}-\sqrt{2}}$ (سؤال 1)

$\frac{2\sqrt{3} + 2\sqrt{2}}{\sqrt{3}-\sqrt{2}} = 2 \frac{\sqrt{3} + \sqrt{2}}{\sqrt{3}-\sqrt{2}} = 2 \frac{(\sqrt{3} + \sqrt{2})(\sqrt{3} + \sqrt{2})}{(\sqrt{3}-\sqrt{2})(\sqrt{3} + \sqrt{2})} = A^2 - 1 = A = \sqrt{2} \Rightarrow \boxed{\sqrt{2}-1}$ جواب

$\rightarrow \sqrt[12]{2^4} \times \sqrt[12]{2 \times 2^6} \times \sqrt[12]{2^9} = 2^{\frac{4}{12}} \times 2^{\frac{1}{12}} \times 2^{\frac{6}{12}} \times 2^{\frac{9}{12}} \times 2^{\frac{1}{12}}$

$= 2^1 \times (2^1)^{\frac{1}{2}} \times 2 = 2 \times 2 \times 2 = \boxed{12}$

(سوال 3)

$$\frac{r^x (1 + r + \dots + r^{4r})}{r^x \left(\frac{1}{r} + \frac{1}{r} + \dots + 1 \right)} = \left(\frac{r}{r} \right)^x \times \frac{1 \times \frac{r^4 - 1}{r - 1}}{\frac{1}{r} \times \frac{r^4 - 1}{r - 1}} =$$

$$\left(\frac{r}{r} \right)^x \times \frac{r^4 - 1}{r^4 - 1} = 1 \Rightarrow \left(\frac{r}{r} \right)^x = 1 \Rightarrow x = 0$$

$$\Rightarrow r^x \times r^{-x} = 1 \Rightarrow r^0 = 1$$

$$\left(\frac{r}{r} \right)^x \times \frac{r}{r} = 1 \Rightarrow \left(\frac{r}{r} \right)^x = \frac{r}{r}$$

$$\Rightarrow x = 1$$

(سوال 6)

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

$$(a^2 - b^2)^r = (\sqrt{4-1} - \sqrt{4+1})^r = (\sqrt{4-1} - \sqrt{4+1})^r$$

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

$$r(4) + r(1) - 1\sqrt{12} = 32 - 1\sqrt{12} = 32 - 14\sqrt{3}$$

$$A = r^{\frac{1}{a}} \times 14^{\frac{1}{1a}} \times r^{\frac{r}{r}} = r^{\frac{1}{a}} \times r^{\frac{r}{1a}} \times r^{\frac{r}{r}} = r^{\frac{1}{a}} \times r^{\frac{r}{a}} \times r^1 = r^{\frac{1+r}{a}} = r^{\frac{1+r}{a}}$$

$$(rA)^{-\frac{1}{r}} = (r \times r^{\frac{1+r}{a}})^{-\frac{1}{r}} = (r^{\frac{1+r}{a}})^{-\frac{1}{r}} = r^{-\frac{1+r}{ar}} = \left(\frac{1}{r}\right)^{\frac{1+r}{a}}$$

$$\sqrt[r]{a} = r^r \times a^{\frac{1a}{r}} \quad \text{سوال 19}$$

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

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

$$\frac{1}{a} - r = r^{\frac{1}{r}} - r = r^{\frac{1}{r}}(1 - r^{\frac{1}{r}})$$

$$\frac{r^{\frac{1}{r}}(1 - r^{\frac{1}{r}})(1 + r^{\frac{1}{r}})}{(1 + r^{\frac{1}{r}})(1 - r^{\frac{1}{r}})} = \frac{r^{\frac{1}{r}}(1 - r^{\frac{1}{r}})}{1 - r} = \frac{r^{\frac{1}{r}}(1 - r^{\frac{1}{r}})}{1 - r} = \frac{r^{\frac{1}{r}}(1 - r^{\frac{1}{r}})}{1 - r}$$

$$r(1 - \sqrt[r]{r}) = 4 - r\sqrt[r]{r}$$

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

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

(سوال ۷)

$$(a + \frac{1}{a})^r = a^r + \frac{1}{a^r} + r = r - \sqrt{r} + \frac{1}{r - \sqrt{r}} + r = \frac{1 - \sqrt{r}}{r - \sqrt{r}} + 1$$

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

$$\left(\frac{r(r - \sqrt{r})}{r - \sqrt{r}}\right)^r = (19)$$

(سوال ۲)

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

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

$$\frac{(1 + \sqrt{r})^{\frac{1}{r}}}{(r + \sqrt{r})^{\frac{1}{r}}} =$$

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

$$\downarrow$$

$$(1 + r\sqrt{r})^{\frac{1}{r}} = r^{\frac{1}{r}} \times (r + \sqrt{r})^{\frac{1}{r}}$$

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

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(سوال ۱۰)

$$\underbrace{\sqrt{x+a} + \sqrt{x-f} - r}_{t}$$

$$r t = x + a - (x - f) = a + f \Rightarrow t = \frac{a+f}{r}$$

$$\sqrt{x+a} - \sqrt{x-f}$$

$$\boxed{\frac{a+f}{r} - r = -r + \frac{a+f}{r} = \frac{a}{r}}$$

~~$$\sqrt{x+a} + \sqrt{x-f} - r + \sqrt{x-f} - \sqrt{x-f} = r\sqrt{x-f}$$~~

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

~~$$r(\sqrt{x+a} + 1) = \frac{r(\sqrt{x+a} + 1)}{\sqrt{x+a} - 1} = \frac{r(\sqrt{x+a} + 1)(\sqrt{x+a} + 1)}{(\sqrt{x+a} - 1)(\sqrt{x+a} + 1)}$$~~

~~$$(\sqrt{x+a} - 1)(\sqrt{x+a} + 1) = x + a - 1$$~~

سوال ۳

$$\text{—) } \frac{\sqrt{27} - 1}{2 + \sqrt{3}} + (2 - \sqrt{3})^{-1}$$

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

مزدوج

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

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

$$\text{الف) } \frac{2\sqrt{2} + 3\sqrt{3}}{2 - \sqrt{4}} - 2(\sqrt[4]{9} - 1)^{-1}$$

$$\frac{(2\sqrt{2} + 3\sqrt{3})(\sqrt{2} + \sqrt{3})}{((\sqrt{2})^2 + (\sqrt{3})^2 - \sqrt{2} \times \sqrt{3})(\sqrt{2} + \sqrt{3})} = \frac{(2\sqrt{2} + 3\sqrt{3})(\sqrt{2} + \sqrt{3})}{2\sqrt{2} + 3\sqrt{3}} = \sqrt{2} + \sqrt{3}$$

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

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