

$$(1! + 3! + 5! + \dots + 15!) (2! + 4! + 6! + \dots + 24!) \quad \text{سوال ۱} (=)$$

چنانچه $24! = 4!$ از $4!$ است $\Rightarrow$ چنانچه $24!$ را $4!$ است

$$2! = 1 \times 2 = 2$$

$$4! = 1 \times 2 \times 3 \times 4 = 24$$

$$2 + 4 = 6 \Rightarrow \text{چنانچه } 6$$

$$1! \rightarrow 1 \quad 3! = 1 \times 2 \times 3 = 6 \quad 4 + 6 = 10$$

$$1 \times 2 = 2 \quad \text{چنانچه } 2$$

سوال ۲ $\Leftarrow$

$$\int \sqrt{(x+\sqrt{x})^{-1}} \times \sqrt{1+\sqrt{x}}$$

$$\int \sqrt{(x+\sqrt{x})^{-1}} \times \sqrt{(1+\sqrt{x})^1} \times x^{\frac{1}{2}} = \int \sqrt{(x+\sqrt{x})^{-1} \times (1+\sqrt{x})^2} \times x^{\frac{1}{2}}$$

$$\int \sqrt{(1+\sqrt{x})^2} \times \frac{1}{\sqrt{(x+\sqrt{x})^2}} \times x^{\frac{1}{2}} = \int \sqrt{2} \times \frac{1}{\sqrt{(1+\sqrt{x})^2}} \times x^{\frac{1}{2}}$$

$$\int \sqrt{2} \times \frac{1}{\sqrt{(1+\sqrt{x})^2}} \times x^{\frac{1}{2}} = \sqrt{2} \times \int \frac{1}{\sqrt{(1+\sqrt{x})^2}} \times x^{\frac{1}{2}}$$

$$\text{ب) } \frac{r_1 + r_2}{r_1 + r_2} (\sqrt{r_1 - r_2} - \sqrt{r_2 - r_1}) = A$$

$$A^2 = \frac{r_1 + r_2 + 2r_1 r_2}{r_1 + r_2 + 2r_1 r_2} \times (r_1 - r_2 + r_2 - r_1 - 2r_1 r_2) = -2$$

$$\frac{r_1 + r_2}{r_1 + r_2} = 1 \quad \frac{r_1 + r_2}{r_1 + r_2} \times \frac{1}{2} \times -2 = -1$$

P. 101

Q. 10

$$\sqrt{x+a} - \sqrt{x-a} = 2$$

$$\sqrt{x+a} + \sqrt{x-a} - 2 = ?$$

~~$$\sqrt{x+a} + \sqrt{x-a} = 4$$~~

~~$$\sqrt{x+a} + \sqrt{x-a} - 2 = 2$$~~

$$2\sqrt{x-a} = 4$$

a+r

Q. 11

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

b)

$$\frac{r_1 + r_2(r_1 + r_2)}{(r_1 - r_2)(r_1 + r_2)} = 4 \quad \frac{r_1 r_2 + r_2(r_1 + r_2)}{19} = 5$$

$$10r_1 + r_1 r_2 + 10r_2 + r_1 r_2 = 9r_1 r_2$$

$$19(r_1 + r_2) = 4r_1 r_2$$

$$r_1 + r_2 - \frac{r_1 r_2}{r_1 - 1} = 4 \quad r_1 + r_2 - \frac{r_1 r_2}{r_2 - 1} = 4 \quad r_1 + r_2 - \frac{r_1 r_2}{r_1 - 1} = 4$$

$$\text{ب) } \frac{r_1 r_2 - 1}{r_1 + r_2} + (r_1 - r_2)^{-1}$$

$$\frac{r_1 r_2 - 1}{r_1 + r_2} = \frac{1}{r_1 - r_2} \quad \frac{r_1 r_2 - 1}{r_1 + r_2} = \frac{1}{r_1 - r_2} \quad \frac{r_1 r_2 - 1}{r_1 + r_2} = \frac{1}{r_1 - r_2}$$

$$r_1 - 1 + \frac{1}{r_1 + r_2} = 4 \quad r_1 - 1 + \frac{1}{r_1 + r_2} = 4 \quad r_1 - 1 + \frac{1}{r_1 + r_2} = 4$$

$$\frac{r_1 + r_2}{r_1 - r_2}$$

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$$\text{الف) } A = \frac{\sqrt{1+r^3} + \sqrt{r^3-1}}{\sqrt{r^3-r^2}} - r$$

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سؤال ٢ =

1,20

$$A^r = \frac{1+r^3 + r^3-1 + r^2r}{r^3-r^2} \Rightarrow A^r = \frac{r(r^3 + r^2r(r^3+r^2))}{r^3-r^2 \times (r^3+r^2)}$$

$$\frac{r(r^3+r^2)^2}{r^3-r^2} = 9 \quad r(1 + r + r^2) = 9 \quad 10 + r^2r$$

$$\text{ب) } \sqrt[3]{r^3} \times \sqrt[3]{14r} \times \sqrt[3]{r^4} = \sqrt[12]{r^3} \times \sqrt[12]{14r} \times \sqrt[12]{r^4}$$

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$$\sqrt[12]{r^3 \times r^4} = 9 \sqrt[12]{r^7} = 9 \sqrt[12]{r^7}$$

$$\sqrt[12]{r^3} \times \sqrt[12]{14r} \times \sqrt[12]{r^4} = 9 \sqrt[12]{r^7} \times \sqrt[12]{r^4}$$

$$9 \times \sqrt[12]{r^7} \times \sqrt[12]{r^4}$$

$$\sqrt[12]{r^7} = 9 \sqrt[12]{r^7}$$

$$= 9 \sqrt[12]{r^7}$$

$$r^x + r^{x+1} + r^{x+2} + r^{x+3} + r^{x+4} + r^{x+5}$$

سوال ۷

$$r^{x-2} + r^{x-1} + r^x + r^{x+1} + r^{x+2} + r^{x+3}$$

$$\frac{r^{x+4} - r^x}{r}$$

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

$$r^{x-1} \times 9 = r \times r^x = r^{x+1} = r^{x-2} \quad x-2=0 \quad \boxed{x=2}$$

$$a = \sqrt{4-r}$$

$$(a^2 + b^2 - rab)(a^2 + b^2 + rab) = t(r - r^2)$$

$$b = \sqrt{4+r}$$

$$(a-b)^2(a+b)^2 = t(r - r^2)$$

$$a^2 - b^2$$

$$(a-b)(a+b) = t(r - r^2)$$

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

$$Z = \sqrt{4-r}$$

$$Z^2 = 4-r$$

$$G = \sqrt{4+r}$$

$$G^2 = 4+r$$

$$4-r + 4+r = 2 \times 4$$

$$\frac{\sqrt{4-r} \times \sqrt{4+r} \times -2}{r} = 4 - 2\sqrt{r}$$

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

$$t = \frac{2\sqrt{4-r}\sqrt{r}}{r - r^2}$$

$$a = \sqrt{4-r}$$

$$a = \sqrt{(r - r^2)} = \sqrt{r - r^2}$$

سوال ۷

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

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

$$a^r + \frac{1}{a^r} + r = r^t$$

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$$\left(a^r + \frac{1}{a^r}\right)^r = r^t \quad \left(r - r^2 + \frac{1}{r - r^2}\right)^r = r^t$$

سوال ۷

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

سوال ۷

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

$$A = \sqrt[r]{r^{\frac{1}{14}}} \times \left(\frac{1}{r}\right)^{-\frac{r}{r}} = \sqrt[r]{r^{\frac{1}{14}}} \times \sqrt[r]{r^{-r}} = \sqrt[r]{r^{\frac{1}{14} - r}} = \sqrt[r]{r^{\frac{1}{14} - r}}$$

سوال ۸

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

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

سوال ۹

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

$$a^{\frac{1}{r}} \times a^{-\frac{1}{r}} = r^{\frac{1}{r}} \quad a^{-\frac{1}{r}} = r^{\frac{1}{r}} \quad a^{-r} = r^{\frac{1}{r}} \quad a^r = \frac{1}{r^{\frac{1}{r}}}$$

$$a = \frac{1}{r^{\frac{1}{r}}} \quad r^{\frac{1}{r}} = r^{\frac{1}{r}} = \frac{1}{r^{\frac{1}{r}}} \quad \frac{1}{r^{\frac{1}{r}}} = \frac{r^{\frac{1}{r}}}{r^{\frac{1}{r}}} = \frac{r^{\frac{1}{r}}}{r^{\frac{1}{r}}} = a$$

$$\frac{1}{r^{\frac{1}{r}}} = \frac{r^{\frac{1}{r}}}{r^{\frac{1}{r}}} \times r^{\frac{1}{r}} = \frac{r^{\frac{1}{r}}}{r^{\frac{1}{r}}} = r^{\frac{1}{r} - \frac{1}{r}} = r^0 = 1$$

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

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د عبارت داده شده در صورت سوال یادآور افتاد مزدوج است ...!

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

$$rt = a+c \rightarrow t = \frac{a}{r} + r \rightsquigarrow t-r = \frac{a}{r} + r - r = \frac{a}{r}$$

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$$A = \sqrt[10]{f^3 \times e^2} (r)^{-1(-\frac{f}{r})} = (r^2)^{\frac{1}{r}} \times r^{\frac{f}{r}} = r^{\frac{f}{r}} = f$$

$$rA = 1 \rightsquigarrow (rA)^{-\frac{1}{f}} = \sqrt[r]{\frac{1}{1}} = \frac{1}{r} = \frac{1}{f} \cdot 10$$

4

$$(a^2 + b^2 - 2ab)^2 = (a-b)^4$$

$$(a^2 + b^2 + 2ab)^2 = (a+b)^4 \rightarrow (a^2 - b^2)^4$$

$$(\sqrt{54-r} + \sqrt{54+r})^2 = [\sqrt{54-r} + \sqrt{54+r} - 2\sqrt{54-r}]^2 = (2\sqrt{54} - 2\sqrt{r})^2$$

$$24 = 1 \quad 1\sqrt{12} = 32 - 14\sqrt{3} = 14(2-\sqrt{3}) \rightsquigarrow \boxed{t=14}$$

4- الف

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

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

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

$$\frac{\sqrt{2}(\sqrt{\sqrt{3}+2})}{\sqrt{\sqrt{3}-2}} = \sqrt{2} \sqrt{\frac{\sqrt{3}+2}{\sqrt{3}-2}} = \sqrt{2} \sqrt{\frac{(\sqrt{3}+2)^2}{3-2}} = \sqrt{2}(\sqrt{3}+2) = \sqrt{4}+2 \xrightarrow{-2} \text{عبارت} = \sqrt{4}$$

4- ب

$$\sqrt[4]{\sqrt[3]{r^4}} = r^{\frac{4}{12}} = r^{\frac{1}{3}}$$

$$\sqrt[4]{14r} = \sqrt[4]{1} \times \sqrt[4]{r} = 1 \times r^{\frac{1}{4}}$$

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

$$\left(r^{\frac{1}{3}} + \frac{1}{2} + \frac{1}{12} \right) \times r = \frac{1+3+1}{12} \times r = \frac{5}{6} \times r = 12$$