

$$(1! + 3! + 5! + \dots + 25!) (2! + 4! + \dots + 24!)$$

سوال 1 =

كيفية حل المسألة
النتيجة

كيفية حل المسألة
النتيجة

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

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

$$2 + 4 = 6 \rightarrow \text{النتيجة}$$

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

$$1 \times 2 = 2 \rightarrow \text{النتيجة}$$

النتيجة

سوال 2 =

$$\text{الف) } \sqrt[4]{(1+\sqrt{5})^{-1}} \times \sqrt{1+\sqrt{5}}$$

$$\sqrt[4]{(1+\sqrt{5})^{-1}} \times \sqrt{(1+\sqrt{5})^1} = \sqrt[4]{(1+\sqrt{5})^{-1} \times (1+\sqrt{5})^2}$$

$$\sqrt[4]{(1+\sqrt{5})^1} \quad (1+\sqrt{5})^2 = 1+2\sqrt{5}+5 = 6+2\sqrt{5} = 2(3+\sqrt{5})$$

$$\sqrt[4]{(1+\sqrt{5})^{-1} \times (1+\sqrt{5})^2} = \sqrt[4]{(1+\sqrt{5})^1} = \sqrt[4]{1+\sqrt{5}}$$

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

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

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

$$\frac{r_1 + r_2 + 2r_1 r_2}{r_1 + r_2 + 2r_1 r_2} = \frac{r_1 + r_2 + 2r_1 r_2}{r_1 + r_2 + 2r_1 r_2}$$

$$\frac{1}{r} \times -2 = -1$$

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سوال 10

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

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

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

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

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

سوال 11

$$\text{الف) } \frac{\sqrt{1} + \sqrt{25}}{2-5} - 2\left(\sqrt{\frac{1}{9}} - 1\right)^{-1}$$

ب) 5

$$\frac{1+5(2+5)}{2-5 \times 2+5} = 4 \quad \frac{2\sqrt{2}+5(2+5)}{19} = 5$$

$$10\sqrt{2} + \frac{2\sqrt{2}}{5} + 10\sqrt{5} + \frac{2\sqrt{5}}{5}$$

$$\frac{19(\sqrt{2}+\sqrt{5})}{19} = 4\sqrt{2} + \sqrt{5}$$

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

$$\text{ب) } \frac{\sqrt{25}-1}{5+\sqrt{5}} + (\sqrt{2}-\sqrt{5})^{-1}$$

$$\frac{5\sqrt{5}-1(5\sqrt{2})}{5+\sqrt{5}(\sqrt{2}-\sqrt{5})} = \frac{5\sqrt{5}-5-\sqrt{2}+\sqrt{5}}{5+\sqrt{5}} = 4 \quad \frac{10(\sqrt{5}-1)}{10}$$

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

$$\frac{2\sqrt{5}+1}{\sqrt{2}-\sqrt{5}}$$

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سؤال ٢ = $A = \frac{\sqrt{1+r^3} + \sqrt{r^3-1}}{\sqrt{r^3-r^2}} - r$ (الف)

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

$$\frac{2(r^3+r^2)^2}{r^3-r^2} = 4 \quad 2(10 + 100) = 4 \quad 10 + 100$$

ج)
$$\sqrt[3]{r^3} \times \sqrt[3]{14r} \times \sqrt[3]{r^3} = \sqrt[3]{r^3} \times 3\sqrt[3]{r} \times \sqrt[3]{r^3}$$

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

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

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

$$9 \times \sqrt[3]{r^3} \times \sqrt[3]{r^3}$$

$$\sqrt[3]{r^3} = 9\sqrt[3]{r^3}$$

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

سوال ۷

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

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

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

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

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

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

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

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

$$a^2 - b^2$$

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

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

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

$$Z^2 = 4-r$$

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

$$G^2 = 4+r$$

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

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

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

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

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

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

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

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

سوال 7

$$r - r^3 + \frac{r^3 + r}{r - r^3} = 4 \quad r - r^3 + r^3 + r = 4 \quad r^2 = 14 \quad 14 = r^2$$

$$A = \sqrt[3]{r^3 \times 14} \times \left(\frac{1}{r}\right)^{-\frac{r}{r}} = \sqrt[3]{r^3 \times 14} \times \sqrt[3]{r^{-r}} = \sqrt[3]{r^3 \times r^{-r}} = \sqrt[3]{r^{-r+3}} = \sqrt[3]{r^{3-r}}$$

$$(rA)^{-\frac{1}{r}} = \left(r \sqrt[3]{r^{3-r}}\right)^{-\frac{1}{r}} = \sqrt[3]{\frac{r^3 \times r^{3-r}}{r}} = (r^{\frac{1}{r}})^{-\frac{1}{r}}$$

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

سوال 9

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

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

$$a = \frac{1}{r^v} \quad r^v = r^3 \quad \frac{1}{r^3 \times r^3} = \frac{r^3}{9} = a$$

$$\frac{1}{r^3} = \frac{9}{r^3 \times r^3} \quad \frac{r^3}{r^3} = r^3 - 3 = 9 \quad r^3 (r^3 - 1)$$

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

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