

$$(1! + 3! + 5! + \dots + 25!) (2! + 4! + 6! + \dots + 26!)$$

سوال (۱)

از این قسمت یکان مندرج شده

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$$\text{یکان برآورد اول} \rightarrow 1 + 6 = 7$$

$$\text{یکان برآورد دوم} \rightarrow 2 + 4 = 6$$

$$7 \times 6 = 42$$

$$\text{سوال (۲)} \quad \sqrt[4]{(4+\sqrt{5})^{-1}} \cdot \sqrt[4]{(1+\sqrt{5})^2} = \sqrt[4]{(4+\sqrt{5})^{-1} (1+\sqrt{5})^2} = \sqrt[4]{\frac{1+2\sqrt{5}}{4+\sqrt{5}}} = \sqrt[4]{2}$$

$$\text{ب) } \frac{\sqrt{2} + \sqrt{5}}{\sqrt{2}(\sqrt{5} + \sqrt{2})} (\sqrt{3} - \sqrt{5} - \sqrt{3} + \sqrt{5}) = \frac{\sqrt{3} - \sqrt{5} - \sqrt{3} + \sqrt{5}}{\sqrt{2}} \times \frac{\sqrt{2}}{\sqrt{2}} = \frac{\sqrt{2} - \sqrt{2} - \sqrt{2} + \sqrt{2}}{2} = 0$$

$$\frac{\sqrt{(\sqrt{5}-1)^2} - \sqrt{(\sqrt{5}+1)^2}}{2} = \frac{|\sqrt{5}-1| - |\sqrt{5}+1|}{2} = \frac{\sqrt{5}-1 - \sqrt{5}-1}{2} = \frac{-2}{2} = -1$$

$$\text{سوال (۳)} \quad \frac{2\sqrt{2} + 3\sqrt{3}}{5 - \sqrt{6}} - 2(\sqrt{3} - 1)^{-1} = \frac{2\sqrt{2} + 3\sqrt{3}}{2 + 3 - \sqrt{2} \times \sqrt{3}} \times \frac{\sqrt{2} + \sqrt{3}}{\sqrt{2} + \sqrt{3}} - \frac{2}{\sqrt{3} - 1} =$$

$$= \frac{(2\sqrt{2} + 3\sqrt{3})(\sqrt{2} + \sqrt{3})}{(\sqrt{2})^2 + (\sqrt{3})^2} - \frac{2}{\sqrt{3} - 1} \times \frac{\sqrt{3} + 1}{\sqrt{3} + 1} = \frac{2\sqrt{2} + 3\sqrt{3}}{5} - \frac{2(\sqrt{3} + 1)}{3 - 1} = \frac{2\sqrt{2} + 3\sqrt{3}}{5} - \sqrt{3} - 1 = \frac{2\sqrt{2} - 2\sqrt{3} - 5}{5}$$

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

$$\sqrt{3} - 1 + \frac{1}{2 - \sqrt{3}} \times \frac{2 + \sqrt{3}}{2 + \sqrt{3}} = \sqrt{3} - 1 + \frac{2 + \sqrt{3}}{4 - 3} = \sqrt{3} - 1 + 2 + \sqrt{3} = 2\sqrt{3} + 1$$

$$\text{سوال (۴)} \quad \frac{(\sqrt{1} + \sqrt{3} + \sqrt{3} - 1)}{\sqrt{3} - \sqrt{2}} \times \frac{\sqrt{3} + \sqrt{2}}{\sqrt{3} + \sqrt{2}} - 2 = (\sqrt{1} + \sqrt{3} + \sqrt{3} - 1)(\sqrt{3} + \sqrt{2}) - 2 =$$

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

$$\sqrt{2(\sqrt{3} + \sqrt{2})^2} - 2 = (\sqrt{3} + \sqrt{2})\sqrt{2} - 2 = \sqrt{6} + 2 - 2 = \sqrt{6}$$

$$\text{ب) } \sqrt[4]{2^4} \times \sqrt[4]{2^4 \times 2} \times \sqrt[4]{(2^4)^2} = 2 \times 2 \times \sqrt[4]{2^4 \times 2^4 \times 2^4} = 4 \times 2 = 12$$

$$\frac{r^x (1 + r^x + r^{2x} + r^{3x} + r^{4x} + r^{5x})}{r^x (r^{-x} + r^{-2x} + 1 + r + r^2 + r^3)} = dx \rightarrow \frac{r^x \times 1 \left(\frac{r^6 - 1}{r^x - 1} \right)}{r^x \times r^{-x} \left(\frac{r^6 - 1}{r^x - 1} \right)} = \left(\frac{r}{r} \right)^x \times \frac{r^6}{1d \cdot r^6} = dx \quad (d \text{ حل})$$

$$\left(\frac{r}{r} \right)^x = r/r^6 = (1/r)^6 \rightarrow x = r$$

$$((a-b)^r)^r ((a+b)^r)^r = [(a-b)(a+b)]^{2r} = (a^r - b^r)^{2r} \quad (6 \text{ سوال})$$

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

$$4(2+2-2\sqrt{5r}) = 4(4-2\sqrt{5r}) = 16(2-\sqrt{5r}) \rightarrow t = 16/$$

$$\left[\left(a + \frac{1}{a} + \sqrt{r} \right) \left(a + \frac{1}{a} - \sqrt{r} \right) \right]^r = \left[\left(a + \frac{1}{a} \right)^r - (\sqrt{r})^r \right]^r = \left(a^r + \frac{1}{a^r} + r - r \right)^r = \quad (7 \text{ سوال})$$

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

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

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

$$r^t = r^r \rightarrow \boxed{t = r}$$

$$\sqrt[10]{r^x \times 14} \times r^{\frac{x}{10}} = \sqrt[10]{r^x \times r^{\frac{x}{10}}} \times r^{\frac{x}{10}} = r^{\frac{x}{10}} \times r^{\frac{x}{10}} = r^{\frac{2x}{10}} = r^{\frac{x}{5}} = r^{\frac{x}{5}} \quad (8 \text{ سوال})$$

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

$$\sqrt{a} = rV \times \sqrt[10]{a^{10}} \rightarrow rV \times a^r \times \sqrt{a} \Rightarrow a^r = \frac{1}{rV} \Rightarrow a = \pm \frac{1}{\sqrt{rV}} \quad (9 \text{ سوال})$$

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

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

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$$\underbrace{(\sqrt{x+a} - \sqrt{x-c})}_r (\sqrt{x+a} + \sqrt{x-c}) = x+a - x+c = a+c \quad (10 \text{ Marks})$$

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