

آزمون کتبی گروه دهم نوبت C

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$$\frac{(1! + 3! + 5! + \dots + 25!)}{1 + 9 = 10} \quad \text{چون مضرب 10} \quad \frac{(2! + 4! + 6! + \dots + 26!)}{2 + 24 = 26} \quad \text{چون مضرب 26}$$

$$\rightarrow 10 \times 26 = 260 \quad (2)$$

چون 2 است

$$\text{الف)} \quad \sqrt[4]{\frac{1}{4+\sqrt{5}}} \times \sqrt[4]{(1+\sqrt{5})^2} = \sqrt[4]{\frac{1}{4+\sqrt{5}} \times (1+\sqrt{5})^2} = \sqrt[4]{2} \quad (2)$$

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$$\text{ب)} \quad \frac{\sqrt{5} + \sqrt{2}}{\sqrt{2}(\sqrt{5} + \sqrt{2})} (\sqrt{2} - \sqrt{5} - \sqrt{2 + \sqrt{5}}) = \frac{\sqrt{2}}{\sqrt{2}} (\sqrt{2} - \sqrt{5} - \sqrt{2 + \sqrt{5}})$$

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

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(الف) عبارت اول  $\rightarrow \frac{\sqrt{2} + \sqrt{3}}{\sqrt{2} - \sqrt{3}} \times \frac{\sqrt{2} + \sqrt{3}}{\sqrt{2} + \sqrt{3}} = \frac{1 + \sqrt{2} + \sqrt{3} + \sqrt{6}}{2 - 3} = \frac{1 + \sqrt{2} + \sqrt{3} + \sqrt{6}}{-1}$  (2)  
 $\rightarrow \frac{1 + \sqrt{2} + \sqrt{3} + \sqrt{6}}{-1} = -1 - \sqrt{2} - \sqrt{3} - \sqrt{6}$

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

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

(ب) عبارت اول  $\rightarrow \frac{\sqrt{2}-1}{\sqrt{2}+\sqrt{3}} \times \frac{\sqrt{2}-1}{\sqrt{2}-1} = \frac{(\sqrt{2}-1)(\sqrt{2}-1)}{2-3} = \frac{2 - \sqrt{2} - \sqrt{2} + 1}{-1} = \frac{3 - 2\sqrt{2}}{-1} = -3 + 2\sqrt{2}$  (3)

عبارت دوم  $\rightarrow (\sqrt{2}-\sqrt{3})^{-1} = \frac{1}{\sqrt{2}-\sqrt{3}} \times \frac{\sqrt{2}+\sqrt{3}}{\sqrt{2}+\sqrt{3}} = \frac{\sqrt{2}+\sqrt{3}}{2-3} = -\sqrt{2}-\sqrt{3}$  10  
 جواب اول  $\rightarrow \sqrt{2} - 1 + \sqrt{2} + \sqrt{3} = \boxed{1 + 2\sqrt{2} + \sqrt{3}}$

(الف)  $\frac{\sqrt{1+\sqrt{2}} + \sqrt{\sqrt{2}-1}}{\sqrt{\sqrt{2}-1}} = A \rightarrow A^2 = \frac{1 + \sqrt{2} + \sqrt{2} - 1 + 2\sqrt{(\sqrt{2}+1)(\sqrt{2}-1)}}{2-1} = \frac{2 + 2\sqrt{2-1}}{1} = 2 + 2\sqrt{1} = 4$  (4)  
 $\rightarrow A = \sqrt{4} = 2$   
 $\sqrt{2} + \sqrt{2} - 2 = \boxed{\sqrt{2}}$  15

(ب)  $\sqrt[3]{\frac{2}{3}} \times \sqrt[3]{\frac{2}{3}} \times \sqrt[3]{\frac{2}{3}} = \sqrt[3]{\frac{2 \times 2 \times 2}{3 \times 3 \times 3}} = \sqrt[3]{\frac{8}{27}} = \frac{2}{3}$  (5)

$\frac{x^n}{x^{n-2}} = 1 \rightarrow \left(\frac{x}{x}\right)^n \times \frac{x^2}{x^0} = 1$  (6)  
 $\rightarrow \left(\frac{x}{x}\right)^n \times \frac{x^2}{1} = 1 \rightarrow \boxed{n=2}$  20

$(a+b)^2(b-a)^2 = ((b+a)(b-a))^2 = (b^2 - a^2)^2$  (7)  
 $\rightarrow (\sqrt{4+2} - \sqrt{4-2})^2 = (\sqrt{4+2} + \sqrt{4-2})^2 = (2 + \sqrt{2} + 2 - \sqrt{2})^2 = (4)^2 = 16$  25

$a = \sqrt[3]{(2-\sqrt{2})^3} = 2 - \sqrt{2} \rightarrow \frac{1}{a^2} = \frac{1}{(2-\sqrt{2})^2} = \frac{2+\sqrt{2}}{2-3} = -2 - \sqrt{2}$  (8)  
 $\left(a + \frac{1}{a}\right)^2 - 2 = \left(2 - \sqrt{2} + \frac{1}{2 - \sqrt{2}}\right)^2 - 2 = \left(2 - \sqrt{2} + \frac{2 + \sqrt{2}}{2 - 3}\right)^2 - 2 = \left(2 - \sqrt{2} - 2 - \sqrt{2}\right)^2 - 2 = (-2\sqrt{2})^2 - 2 = 8 - 2 = 6$  30

$$A = r^{\frac{1}{\omega}} \times r^{\frac{1}{\omega}} \times r^{\frac{1}{\omega}} = r^{\frac{3}{\omega}} = r^{\frac{3}{\omega}} \rightarrow (rA)^{-\frac{1}{\omega}} = (r^{\frac{3}{\omega}})^{-\frac{1}{\omega}} = \left(\frac{1}{r}\right) \quad (n)$$

$$\sqrt{a} = r \sqrt{a} a^{\frac{1}{\omega}} \rightarrow a = r^{\frac{1}{\omega}} \times a^{\frac{1}{\omega}} \rightarrow a^{-\frac{1}{\omega}} = r^{\frac{1}{\omega}} \rightarrow a^{-1} = r \sqrt{r} \quad (q)$$

$$\frac{1}{a} - r = r(\sqrt{r} - 1) \quad \frac{r(\sqrt{r} - 1)}{\sqrt{r} + 1} \times \frac{\sqrt{r} - 1}{\sqrt{r} - 1} = \frac{r - r\sqrt{r}}{r} = \boxed{1 - \sqrt{r}}$$

$$\underbrace{(\sqrt{n+a} - \sqrt{n-b})}_r \underbrace{(\sqrt{n+a} + \sqrt{n-b})}_{\frac{a+b}{r}} = n+a - (n-b) = a+b \quad (10)$$

$$\frac{a+b}{r} = r = \left(\frac{a}{r}\right)$$