

$$1! + 3! = \boxed{4}$$

$2! + 4! = 2[6] \rightarrow \text{يُفَان}$

$$\Rightarrow 7 \times 6 = 42 \rightarrow \text{نکات}$$

جواب نهایی

$$۲) \text{ الف } \sqrt[4]{(x+\sqrt{v})^{-1} \times \sqrt{1+\sqrt{v}}} = \sqrt[4]{(x+\sqrt{v})^{-1}} \times \sqrt[4]{(1+\sqrt{v})^2} = \sqrt[4]{(x+\sqrt{v})^{-1}} \times \sqrt[4]{8+2\sqrt{v}} = \sqrt[4]{\frac{8+2\sqrt{v}}{x+\sqrt{v}}} = \sqrt[4]{\frac{2}{x+\sqrt{v}}}$$

$$b) \left(\frac{\sqrt{y} + \sqrt{a}}{\sqrt{10+y}} \right) (\sqrt{y-\sqrt{a}} - \sqrt{y+\sqrt{a}}) = \left(\frac{\sqrt{y} + \sqrt{a}}{\sqrt{y}(\sqrt{a} + \sqrt{y})} \right) (\sqrt{y-\sqrt{a}} - \sqrt{y+\sqrt{a}}) =$$

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

$$\text{الف ٣)} \frac{\sqrt{1} + \sqrt{27}}{\omega - \sqrt{6}} - 2(\sqrt[4]{9} - 1)^{-1} = \frac{2\sqrt{2} + 3\sqrt{3}}{(\sqrt{2})^2 + (\sqrt{3})^2 - \sqrt{2} \times \sqrt{3}} - \frac{2}{\sqrt{3} - 1}$$

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

$$\text{(\cdot)} \frac{\sqrt{y}-1}{1+\sqrt{y}} + (\sqrt{y}-1)^{-1} = \frac{y\sqrt{y}-1}{1+y-\sqrt{y}} \times \frac{\sqrt{y}-1}{\sqrt{y}-1} + \frac{1}{y-\sqrt{y}} \times \frac{y+\sqrt{y}}{y+\sqrt{y}} = \frac{(y\sqrt{y}-1)(\sqrt{y}-1)}{y\sqrt{y}-1} + y + \sqrt{y}$$

$$\sqrt{y}-1 + y + \sqrt{y} = y\sqrt{y} + 1$$

(الف)

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

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

$$b) \sqrt[5]{x^5 \sqrt{x}} \times \sqrt[5]{16x} \times \sqrt[5]{x^5 \sqrt{x}} = x^{\frac{5}{5}} \times x^{\frac{1}{5}} \times x^{\frac{5}{5}} \times x^{\frac{1}{5}} = x \times x = x^2 \quad \boxed{\sqrt[5]{x^5 \sqrt{x}}}$$

$$d) \frac{x^2 + x^{2+1} + x^{2+2} + x^{2+3} + x^{2+4} + x^{2+5}}{x^{2-2} + x^{2-1} + x^2 + x^{2+1} + x^{2+2} + x^{2+3}} = \Delta x \rightarrow \frac{x^2(1+x+9+\dots+x^5)}{x^{2-2}(1+x+x+\dots+x^5)} =$$

$$\frac{x^2(\frac{x^6-1}{x-1})}{x^{2-2}(\frac{x^6-1}{x-1})} = \frac{x^2(x^5-1)}{x^{2-2}(x^5-1)} = \frac{x^2 \times x^5 \times x^1}{x^{2-2} \times x^5 \times x^1} = \Delta x \rightarrow 13 \times x^2 \rightarrow \frac{x^{2-2}}{x^{2-2}} = 1 \rightarrow x^2 = x^2$$

$$f) (a^r + b^r - r a^r b^r)^r (a^r + b^r + r a^r b^r)^r = ((a^r + b^r)^r - r a^r b^r)^r ((a^r + b^r)^r + r a^r b^r)^r = (a^r + b^r - r a^r b^r)^r = \left[(\sqrt[5]{\sqrt{3}-2})^5 + (\sqrt[5]{\sqrt{3}+2})^5 - r(\sqrt[5]{\sqrt{3}-2})(\sqrt[5]{\sqrt{3}+2}) \right]^r = (r\sqrt[5]{3}-r\sqrt[5]{2})^r = [r\sqrt[5]{2}(\sqrt[5]{3}-1)]^r = 16(r-\sqrt[5]{3}) = t(r-\sqrt[5]{3}) \rightarrow \boxed{t=16}$$

$$v) a - \sqrt[5]{x^5 \sqrt{x}} = \sqrt[5]{(x-\sqrt{x})^5} = \sqrt{x-\sqrt{x}} \rightarrow (a + \frac{1}{a} + \sqrt{x})^r (a + \frac{1}{a} - \sqrt{x})^r = ((a + \frac{1}{a})^r - r)^r = (a^r + \frac{1}{a^r} + r - r)^r = (a^r + \frac{1}{a^r})^r = (x - \sqrt{x} + \frac{1}{x-\sqrt{x}})^r =$$

$$(x - \sqrt{x} + x + \sqrt{x})^r = 16 = x^t \Rightarrow \boxed{t=5}$$

$$h) A = \sqrt[5]{x^5 \sqrt{16}} \times (\frac{1}{x})^{-\frac{5}{5}} = x^{\frac{5}{5}} \times x^{\frac{5}{5}} = x \rightarrow (xA)^{-\frac{1}{5}} = A^{-\frac{1}{5}} = \frac{1}{x}$$

$$q) x \sqrt[5]{a^{\frac{10}{5}}} = a^{\frac{1}{5}} \rightarrow x \sqrt[5]{a^2} = 1 \rightarrow a = \frac{1}{x^5 \sqrt[5]{2}}$$

$$\hookrightarrow \frac{\frac{1}{a} - x}{1 + \sqrt{x}} = \frac{x\sqrt{x} - x}{1 + \sqrt{x}} \times \frac{\sqrt{x}-1}{\sqrt{x}-1} = \frac{x(x - x\sqrt{x})}{x} = \frac{x - x\sqrt{x}}{x}$$

$$10) (\sqrt{x+a} - \sqrt{x-f}) (\sqrt{x+a} + \sqrt{x-f}) = a+f \rightarrow \sqrt{x+a} + \sqrt{x-f} = \frac{a+f}{r} = \sqrt{x+a} + \sqrt{x-f} - r = \frac{a}{r} + r - r = \frac{a}{r}$$

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