

$$1. (7 + \sqrt{6})(1 - \sqrt{6}) - 5 \left(\sqrt[3]{23 - \sqrt[3]{-64}} - \sqrt{2} \cdot \sqrt{3} \right) + \sqrt{6}$$

$$7 - 7\sqrt{6} + \sqrt{6} - 6 - 5 \left(\sqrt[3]{23 + 4} - \sqrt{6} \right) + \sqrt{6} = 1 - 5\sqrt{6} - 5(3 - \sqrt{6}) + \sqrt{6} = 1 - 5\sqrt{6} - 15 + 5\sqrt{6} = -14$$

$$2. (\sqrt{3 + \sqrt{5}} - \sqrt{7 - \sqrt{3}})(\sqrt{3 + \sqrt{5}} + \sqrt{7 - \sqrt{3}}) \cdot \frac{\sqrt{5 - \sqrt{3} + 4}}{4\sqrt{3} - 7}$$

$$(3 + \sqrt{5} - 7 + \sqrt{3}) \cdot \frac{\sqrt{5 - \sqrt{3} + 4}}{4\sqrt{3} - 7} = \frac{[\sqrt{5} + (\sqrt{3} - 4)][\sqrt{5} - (\sqrt{3} - 4)]}{4\sqrt{3} - 7} =$$

$$= \frac{5 - (3 - 8\sqrt{3} + 16)}{4\sqrt{3} - 7} = \frac{-14 + 8\sqrt{3}}{4\sqrt{3} - 7} = \frac{2(4\sqrt{3} - 7)}{4\sqrt{3} - 7} = 2$$

$$3. [(\sqrt{2})^3 \cdot \sqrt{6} : \sqrt[3]{2}]^2 \cdot \sqrt[3]{3\sqrt{2}} : \frac{\sqrt{8}}{\sqrt[3]{9}} \cdot \sqrt{\frac{1}{8} \cdot 4 \sqrt{6} \sqrt{\frac{64}{9}}}$$

$$\left(\sqrt[6]{2^9 \cdot 2^3 \cdot 3^3 : 2^2} \right)^2 \cdot \sqrt[3]{\sqrt{3^2 \cdot 2}} \cdot \frac{\sqrt[3]{3^2}}{\sqrt{2^3}} \cdot \sqrt{\frac{1}{8} \cdot 4 \cdot \frac{8}{3}} = \left(\sqrt[6]{2^{10} \cdot 3^3} \right)^2 \cdot \sqrt[6]{3^2 \cdot 2} \cdot \sqrt[6]{3^4 : 2^9} \cdot \sqrt{\frac{1}{8} \cdot 2} =$$

$$= \sqrt[6]{2^{20} \cdot 3^6 \cdot 3^2 \cdot 2 \cdot 3^4 : 2^9} \cdot \frac{1}{2} = \sqrt[6]{2^{12} \cdot 3^{12}} \cdot \frac{1}{2} = \sqrt[6]{(2^2 \cdot 3^2)^6} \cdot \frac{1}{2} = \frac{2^2 \cdot 3^2}{2} = 2 \cdot 3^2 = 18$$

$$4. \left(\sqrt{y} - \frac{1}{x} \right) \left(\frac{1}{x} + \sqrt{y} \right) \cdot \frac{1}{1 - x^2 y}$$

$$\left(y - \frac{1}{x^2} \right) \cdot \frac{1}{1 - x^2 y} = \frac{x^2 y - 1}{x^2} \cdot \frac{1}{1 - x^2 y} = \frac{-(1 - x^2 y)}{x^2} \cdot \frac{1}{1 - x^2 y} = -\frac{1}{x^2} \quad C.A.: \begin{cases} x \neq 0 \\ y > 0 \\ x^2 y \neq 1 \end{cases}$$

$$5. \frac{1}{\sqrt{x+2} - \sqrt{x}} + \frac{1}{\sqrt{y+3} - \sqrt{y}} - \sqrt{\frac{x+2}{4}} - \sqrt{\frac{y+3}{9}}$$

$$\frac{1}{\sqrt{x+2} - \sqrt{x}} \cdot \frac{\sqrt{x+2} + \sqrt{x}}{\sqrt{x+2} + \sqrt{x}} + \frac{1}{\sqrt{y+3} - \sqrt{y}} \cdot \frac{\sqrt{y+3} + \sqrt{y}}{\sqrt{y+3} + \sqrt{y}} - \frac{\sqrt{x+2}}{2} - \frac{\sqrt{y+3}}{3} =$$

$$= \frac{\sqrt{x+2} + \sqrt{x}}{2} + \frac{\sqrt{y+3} + \sqrt{y}}{3} - \frac{\sqrt{x+2}}{2} - \frac{\sqrt{y+3}}{3} = \frac{\sqrt{x+2} + \sqrt{x} - \sqrt{x+2}}{2} + \frac{\sqrt{y+3} + \sqrt{y} - \sqrt{y+3}}{3} = \frac{\sqrt{x}}{2} + \frac{\sqrt{y}}{3} \quad C.A.: \begin{cases} x+2 \geq 0 \\ x \geq 0 \\ y+3 \geq 0 \\ y \geq 0 \end{cases} \begin{cases} x \geq 0 \\ y \geq 0 \end{cases}$$

$$6. \left(\sqrt{x} - \frac{\sqrt{x}}{1 - \sqrt{x}} - \frac{x}{1 + \sqrt{x}} \right) : x$$

$$\frac{\sqrt{x}(1-x) - \sqrt{x}(1+\sqrt{x}) - x(1-\sqrt{x})}{(1-\sqrt{x})(1+\sqrt{x})} \cdot \frac{1}{x} = \frac{\sqrt{x} - x\sqrt{x} - \sqrt{x} - x - x + x\sqrt{x}}{1-x} \cdot \frac{1}{x} = \frac{-2x}{1-x} \cdot \frac{1}{x} = \frac{2}{x-1} \quad C.A.: \begin{cases} x \geq 0 \\ x \neq 1 \end{cases}$$