

$$1) (\sqrt{3^2 \cdot 2} + \sqrt{2^3} + \sqrt{2})^2 = (3\sqrt{2} + 2\sqrt{2} + \sqrt{2})^2 = (6\sqrt{2})^2 = 36 \cdot 2 = 72$$

Da evitare:

$$\begin{aligned} 18 + 8 + 2 + 2\sqrt{18 \cdot 8} + 2\sqrt{18 \cdot 2} + 2\sqrt{8 \cdot 2} &= \\ = 28 + 2\sqrt{2 \cdot 3^2 \cdot 2^3} + 2\sqrt{2 \cdot 3^2 \cdot 2} + 2\sqrt{2^3 \cdot 2} &= \\ = 28 + 2\sqrt{2^4 \cdot 3^2} + 2\sqrt{2^2 \cdot 3^2} + 2\sqrt{2^4} = 28 + 2 \cdot 2^2 \cdot 3 + 2 \cdot 2 \cdot 3 + 2 \cdot 2^2 &= \\ = 28 + 24 + 12 + 8 = 72 \end{aligned}$$

$$2) \frac{\sqrt[8]{2^4 a^4 b^4}}{\sqrt[4]{3^4 b^4}} = \frac{\sqrt{2 a b^3}}{3b} = \frac{\sqrt{2ab}}{3}$$

$$3) x^{-4} + 2x^{-2} \cdot x + x^2 = x^{-4} + 2x^{-1} + x^2$$

$$\begin{aligned} 4) (9\sqrt{2} + 9\sqrt{3} - 2\sqrt{12} - 2\sqrt{18})(5\sqrt{2} - 2\sqrt{3}) &= \\ = (9\sqrt{2} + 9\sqrt{3} - 4\sqrt{3} - 6\sqrt{2})(5\sqrt{2} - 2\sqrt{3}) &= \\ = (3\sqrt{2} + 5\sqrt{3})(5\sqrt{2} - 2\sqrt{3}) = \cancel{15 \cdot 2} - 6\sqrt{6} + 25\sqrt{6} - \cancel{10 \cdot 3} &= 19\sqrt{6} \end{aligned}$$

Oppure: meglio moltiplicare prima la 2^a e la 3^a parentesi:

$$\begin{aligned} (9 - 2\sqrt{6})(5 \cdot 2 - 2\sqrt{6} + 5\sqrt{6} - 2 \cdot 3) &= \\ = (9 - 2\sqrt{6})(4 + 3\sqrt{6}) &= \\ = \cancel{36} + 27\sqrt{6} - 8\sqrt{6} - 6 \cdot 6 &= 19\sqrt{6} \end{aligned}$$

$$5) \sqrt[3]{\sqrt{3^{-12}}} \cdot 27 = \sqrt[6]{3^{-12}} \cdot 3^3 = 3^{-2} \cdot 3^3 = 3$$

$$\begin{aligned}
 6) \quad \sqrt{15} \left(\sqrt{\frac{3}{5}} + \sqrt{\frac{5}{3}} + \sqrt{\frac{12}{5}} \right) &= \\
 &= \sqrt{\frac{3 \cdot 15}{5}} + \sqrt{\frac{5 \cdot 15}{3}} + \sqrt{\frac{12 \cdot 15}{5}} = \sqrt{9} + \sqrt{25} + \sqrt{36} = \\
 &= 3 + 5 + 6 = 14
 \end{aligned}$$

$$\begin{aligned}
 7) \quad \sqrt[3]{\frac{(x-3)^2}{x}} \cdot \sqrt{\frac{x^4}{x-3}} &= \sqrt[6]{\frac{(x-3)^4}{x^2}} \cdot \sqrt[6]{\frac{x^{12}}{(x-3)^3}} = \\
 &= \sqrt[6]{\frac{(x-3)^4}{x^2} \cdot \frac{x^{12}}{(x-3)^3}} = \sqrt[6]{x^{10}(x-3)} = x \sqrt[6]{x^4(x-3)}
 \end{aligned}$$

$$\begin{aligned}
 8) \quad \frac{\sqrt[12]{2^6} \cdot \sqrt{2^5}}{\sqrt[3]{2^3} \cdot \sqrt{2^{12}}} &= \frac{\sqrt{2} \cdot 2^2 \sqrt{2}}{\sqrt[3]{2^3 \cdot 2^6}} = \frac{2^2 \cdot \sqrt{2} \cdot \sqrt{2}}{\sqrt[3]{2^9}} = \frac{2^3}{2^3} = 1 \\
 &\text{opposite} \left(\frac{\sqrt{2} \cdot 2^2 \sqrt{2}}{2 \sqrt[3]{2^6}} = \frac{2^2 \cdot 2}{2 \cdot 2^2} = \frac{2^3}{2^3} = 1 \right)
 \end{aligned}$$