

$$1) \quad \sqrt[3]{\sqrt{a^4} \sqrt{a^3} \sqrt[3]{a} a^2}$$

$$\left[\left(a^4 a^{3/2} a^{1/3} \right)^{1/2} a^2 \right]^{1/3}$$

$$\left[\left(a^{\frac{24+9+2}{6}} \right)^{1/2} a^2 \right]^{1/3}$$

$$\left[\left(a^{\frac{35}{6}} \right)^{1/2} a^2 \right]^{1/3} = \left[a^{35/12} \cdot a^2 \right]^{1/3}$$

$$\left[a^{59/12} \right]^{1/3} = a^{59/36} = 36 \sqrt[36]{a^{59}}$$

$$2) \frac{3 \cdot (2x^{-2}y^{-3})^2}{4(3a^3b^{-7})^3} \cdot \frac{2}{9} \frac{(3a^4b^{-3})^2}{9(2x^{-1}y^{-2})^3}$$

$$\frac{2 \cdot 2^2 x^{-4} y^{-6} \cdot 3^2 a^8 b^{-6}}{3 \cdot 3^3 a^9 b^{-6} \cdot 2^3 x^{-3} y^{-6}}$$

$$\frac{2 \cdot 2^2 \cdot 3^2}{3 \cdot 3^3 \cdot 2^3}$$

$$\frac{a^8 b^6 x^3 y^6}{x^4 y^6 b^6 a^9}$$

$$\frac{1}{9} \cdot \frac{1}{ax}$$

$$3) \frac{42}{\sqrt[n]{x^{10}}} \cdot \frac{24\sqrt{x^{4n-6}}}{(\sqrt[n]{x^2})^{3-2n}} \div \left(\frac{(\sqrt[n]{x})^{2n+1}}{\sqrt[n/2]{x^{6-n}}} \right)^{-2}$$

$$42 \cdot \frac{1}{\sqrt[n]{x^{10}}} \cdot \frac{(\sqrt[n]{x^2})^{3-2n}}{24\sqrt{x^{4n-6}}} \cdot \frac{\left((\sqrt[n]{x})^{2n+1} \right)^2}{\left(\sqrt[n/2]{x^{6-n}} \right)^2}$$

$$42 \cdot \frac{1}{x^{10/n}} \cdot \frac{x \cdot \frac{2 \cdot (3-2n)}{n}}{x \cdot \frac{4n-6}{2n}} \cdot \frac{x \cdot \frac{(2n+1) \cdot 2}{n}}{x \cdot \frac{(6-n) \cdot 2}{n/2}}$$

$$42 \cdot x \cdot \frac{-10 + 6 - 4n - (2n-3) + 4n + 10 - (24-4n)}{n} \cdot 42 \cdot x^{\frac{2n-15}{n}}$$