

$$2) \frac{3(2x^{-2}y^{-3})^2}{4(3a^3b^{-2})^3} \cdot \frac{8(3a^4b^{-3})^2}{9(2x^{-1}y^{-2})^3}$$

$$\frac{2 \cdot 4 \cdot x^{-4} \cdot y^{-6}}{3 \cdot 27 \cdot a^9 \cdot b^{-6} \cdot 8 \cdot x^{-3} \cdot y^{-6}} = \frac{x^{-1}}{9a} = \frac{1}{9ax}$$

$$3) \frac{\frac{42}{x^{10/n}}}{\frac{4n-6}{x^{2n}}} \cdot \left(\frac{x^{\frac{2n+5}{n}}}{x^{\frac{6-n}{n/2}}} \right)^2 = \frac{42}{x^{10/n}} \cdot \frac{x^{\frac{6-4n}{n}}}{x^{\frac{2n-3}{n}}} \cdot \frac{x^{\frac{4n+10}{n}}}{x^{\frac{2n-4n}{n}}}$$

$$\frac{42 \cdot x}{42 \cdot x^{\frac{2n-15}{n}}} = \frac{42x^2}{\sqrt[n]{x^{15}}}$$

$$1) \left(\frac{1}{\sqrt{e}}\right)^{\ln \frac{1}{9}} + 100^{\log \frac{1}{2}} - 16^{\frac{1}{2} \lg 4} + 2 \log \frac{1}{100} \\ - 3 \ln \frac{1}{e^3} + \frac{1}{4} \lg \frac{1}{256}$$

$$(e^{-1/2})^{\ln \frac{1}{9}} + 10^{2 \log \frac{1}{2}} - (2^4)^{\frac{1}{2} \lg 4} + \log (10^{-2})^2 \\ - \ln (e^{-3})^3 + \lg (2^8)^{\frac{1}{4}}$$

$$e^{\ln 3} + 10^{\log \frac{1}{4}} - 2^{\lg 16} + \log 10^{-4} - \ln e^{-9} + \lg 2^2 \\ 3 + \frac{1}{4} - 16 - 4 - 9 + 2 = -23 \frac{3}{4}$$