When taking a power of a power the base stays the same and we multiply the exponents.

\[(x^3)^5\]  \[(3^4)^2\]  \[(y^3)^8\]

\[\left(\frac{ax}{by}\right)^4\] means \[\frac{ax}{by}\cdot\frac{ax}{by}\cdot\frac{ax}{by}\cdot\frac{ax}{by}\]

or \[a\cdot a\cdot a\cdot a\cdot x\cdot x\cdot x\cdot x\]
\[b\cdot b\cdot b\cdot b\cdot y\cdot y\cdot y\cdot y\]

\[\frac{a^4\cdot x^4}{b^4\cdot y^4}\]

The power of a product/quotient is the product/quotient of the individual factors raised to the power.