Example Using Many Exponential Rules

\[
\left( \frac{x^{-2} y^4 z^{-5}}{x y^5 z^{-2}} \right)^{-3}
\]

1st step is to **distribute** that -3 by using the power rule for exponents. This means to multiply all exponents by -3.

\[
\frac{x^{6} y^{-12} z^{15}}{x^{-3} y^{-15} z^6}
\]
The -3 was distributed. Do not do anything else. One step at a time.

\[
\frac{x^{6} y^{-12} z^{15}}{x^{-3} y^{-15} z^6}
\]
Now what we do here is **switch the negative exponents**. Any letter with a negative exponent moves to the other level. It’s like they are holding out an elevator ticket, and they want to go upstairs or downstairs. Once they move there, they use up their elevator ticket, and become a positive exponent.

\[
\frac{x^6 x^3 y^{15} z^{15}}{y^{12} z^6}
\]
The negative exponents are switched. Do not do anything else. One step at a time. The variables with positive exponents stayed in place. Next, we will **combine/simplify** the variables that are alike.

\[
x^9 y^3 z^9
\]
This is the answer. As it happens, there is nothing left on the bottom. The exponents on the x’s were added. The exponents on the y’s were subtracted (there are more on top than on the bottom, so there is leftover on the top). The exponents on the z’s were also subtracted.