

Negative Exponents

Example 1 Simplify in exponential notation $\frac{5^2}{5^5}$

$$\frac{5^2}{5^5} = 5^{2-5} \text{ which equals } 5^{-3}$$

$$\frac{5^2}{5^5} = \frac{\cancel{5} \times \cancel{5}}{\cancel{5} \times \cancel{5} \times 5 \times 5 \times 5}, \text{ dividing out the 5's, we have } \frac{1}{5 \times 5 \times 5} = \frac{1}{5^3}$$

Example 2 Simplify in exponential notation $\frac{7^4}{7^6}$

$\frac{7^4}{7^6} = 7^{4-6}$ which equals 7^{-2} . Doing it by the definition of exponent, we get,

$$\frac{7^4}{7^6} = \frac{\cancel{7} \times \cancel{7} \times \cancel{7} \times \cancel{7}}{\cancel{7} \times \cancel{7} \times \cancel{7} \times \cancel{7} \times 7 \times 7}, \text{ dividing out the 7's, we have } \frac{1}{7 \times 7} = \frac{1}{7^2}$$

Any base, except 0, raised to a negative exponent is equal to 1 over the base raised to a positive exponent.

$$A^{-n} = \frac{1}{A^n}, \quad A \neq 0$$