

## Exponentiation and Division

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**Proposition 0.1.** Let  $n, m, k$  be natural numbers such that  $k$  is nonzero and  $n \geq m$ . Then

$$\frac{k^n}{k^m} = k^{n-m}.$$

*Proof.* We have  $k^n = k^{(n-m)+m} = k^{n-m} \cdot k^m$ . Hence

$$\frac{k^n}{k^m} = \frac{k^{n-m} \cdot k^m}{k^m} = \frac{k^{n-m} \cdot k^m}{1 \cdot k^m} = \frac{k^{n-m}}{1} = k^{n-m}.$$

□