

# Factsheet: Laws of indices

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## Summary

A list of laws of indices.

*The associated study guide for this factsheet is [Guide: Laws of indices](#). If you would like to know more about these, please read the guide.*

Throughout this factsheet,  $a, b$  are positive real numbers,  $r$  and  $s$  are real numbers, and  $n$  is a positive whole number.

## Laws of indices

**Law 1:**  $a^r \cdot a^s = a^{r+s}.$

**Law 2:**  $\frac{a^r}{a^s} = a^{r-s}.$

**Law 3:**  $(a^r)^s = a^{r \cdot s}.$

**Law 4:** If  $a$  is non-zero, then  $a^0 = 1.$

**Law 5:**  $a^{-r} = \frac{1}{a^r}$

**Law 6:**  $a^{1/n} = \sqrt[n]{a}.$

**Law 7:**  $a^r \cdot b^r = (ab)^r.$

**Law 8:**  $\frac{a^r}{b^r} = \left(\frac{a}{b}\right)^r.$

**Law 9:**  $a^{1/n} \cdot b = \sqrt[n]{a \cdot b^n}.$

**Law 10:**  $\sqrt[n]{a \cdot b} = \sqrt[n]{a} \cdot \sqrt[n]{b}.$

For more on the subject, please go to [Guide: Laws of indices](#)