

INKMATHS FLASHCARDS

Indices and log laws

6 cards · fronts and backs

Print double-sided, flipping on the long edge, and each answer lands behind its question. Cut along the card borders.

Definitions in precise wording, the standard results the formulae booklet does not print, a check-yourself question per topic, and the slips that lose marks. The same cards run on the website with spaced-repetition scheduling, at inkmaths.co.uk/flashcards.

STANDARD RESULT

Product law:

$$\log_a x + \log_a y = ?$$

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STANDARD RESULT

Quotient law:

$$\log_a x - \log_a y = ?$$

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STANDARD RESULT

Power law:

$$k \log_a x = ?$$

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DEFINITION

Define: Logarithm.

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CHECK YOURSELF

Write $2 \log 3 + \log 4$ as a single logarithm.

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SPOT THE ERROR

Say what is wrong with this claim:

$\log(x + y)$ is the same as $\log x + \log y$.

INDICES AND LOG LAWS

STANDARD RESULT

$$\log_a x - \log_a y = \log_a (x/y)$$

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STANDARD RESULT

$$\log_a x + \log_a y = \log_a (xy)$$

INDICES AND LOG LAWS

DEFINITION

log to base a of x is the power to which a must be raised to give x : if $a^y = x$ then y equals log base a of x , for $a > 0$, $a \neq 1$ and $x > 0$.

INDICES AND LOG LAWS

STANDARD RESULT

$$k \log_a x = \log_a (x^k)$$

INDICES AND LOG LAWS

SPOT THE ERROR

The product law says $\log x + \log y = \log(xy)$: logs turn products into sums, not sums into sums. $\log(x + y)$ does not simplify. Try $x = y = 10$: $\log 20$ is about 1.3, but $\log 10 + \log 10 = 2$.

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CHECK YOURSELF

$$2 \log 3 = \log 9, \text{ and } \log 9 + \log 4 = \log 36.$$

INDICES AND LOG LAWS