

Logarithm lattice

Problem

Can you arrange some of these logarithms to complete the grid below? The values of the logarithms need to increase along the rows and down the columns. Try to do this without using a calculator.



$$\log_3 2 \quad \log_4 5 \quad \log_2 5 \quad \log_3 4 \quad \log_3 5 \quad \log_5 3$$

$$\log_4 2 \quad \log_2 4 \quad \log_2 3 \quad \log_5 2 \quad \log_5 4 \quad \log_4 3$$

		Increasing size →		
Increasing size ↓		$\log_{\square} \square$	$\log_{\square} \square$	$\log_{\square} \square$
		$\log_{\square} \square$	1	$\log_{\square} \square$
		$\log_{\square} \square$	$\log_{\square} \square$	$\log_{\square} \square$

Think about

- Can you put pairs of logarithms from the list in order of size?
- Which logarithms are bigger than 1 and which ones are smaller?

Can you use the original logarithms to complete this grid too?

		Increasing size →		
Increasing size ↓		$\log_4 2$	$\log_{\square} \square$	$\log_{\square} \square$
		$\log_{\square} \square$	1	$\log_{\square} \square$
		$\log_{\square} \square$	$\log_{\square} \square$	$\log_2 4$