

Log Lattice

All logarithms are in the format of $\log_a b$

→ Increasing Size →

	a	2	3	4	5
b		$\log_5 2$	$\log_5 3$	$\log_5 4$	1
5		$\log_4 2$	$\log_4 3$	1	$\log_4 5$
4		$\log_3 2$	1	$\log_3 4$	$\log_3 5$
3		1	$\log_2 3$	$\log_2 4$	$\log_2 5$
2		1	$\log_2 3$	$\log_2 4$	$\log_2 5$

Increasing Size ↓

All the logarithms to the top-left half of the table are smaller than 1. All the logarithms to the bottom-right half are bigger than 1.

The smallest logarithm is in the top-left corner ($\log_5 2$) while the largest ($\log_2 5$), is in the bottom-right corner.

So let $\log_5 2$ and $\log_2 5$ be fixed:

Increasing Size →

Increasing Size ↓	$\log_5 2$		
		1	
			$\log_2 5$

The next two smallest logarithms are $\log_4 2$ and $\log_5 3$ while the next two largest ones are $\log_2 4$ and $\log_3 5$.

We can place them in as shown below:

Increasing Size →

Increasing Size ↓	$\log_5 2$	$\log_5 3$	
	$\log_4 2$	1	$\log_3 5$
		$\log_2 4$	$\log_2 5$

The two logarithms from each set ($\log_4 2, \log_5 3$ and $\log_2 4$ and $\log_3 5$) can switch places.

Any two logarithms can be chosen from the remaining six and put into the two blank spaces as they would always fit the table.

Increasing Size →

Increasing Size ↓	$\log_5 2$	$\log_4 2$	
	$\log_5 3$	1	$\log_2 4$
		$\log_3 5$	$\log_2 5$

Some possible answers:

	Increasing Size →		
Increasing Size ↓	\log_5^2	\log_5^3	\log_3^4
	\log_4^2	1	\log_3^5
	\log_4^3	\log_2^4	\log_2^5

	Increasing Size →		
Increasing Size ↓	\log_5^2	\log_4^2	\log_5^3
	\log_5^3	1	\log_2^4
	\log_2^3	\log_3^5	\log_2^5