

## Rechenregeln für Logarithmen

Dokumentnummer: D1919  
Fachgebiet: Tabellenverarbeitung  
Logarithmusfunktion

Gegeben ist eine Wertetabelle

(%i1)  $x:[1,2,3,4,5];y:[6,7,8,9,10];$

(%o1) [ 1 , 2 , 3 , 4 , 5 ]

(%o2) [ 6 , 7 , 8 , 9 , 10 ]

Wir berechnen weitere Werte dieser Tabelle

(%i3)  $x*y;x/y;$

(%o3) [ 6 , 14 , 24 , 36 , 50 ]

(%o4)  $[\frac{1}{6}, \frac{2}{7}, \frac{3}{8}, \frac{4}{9}, \frac{1}{2}]$

REGEL:  $C = A + B$

bedeutet  $\log(x.y) = \log(x) + \log(y)$

(%i5)  $A:\text{map}(\log,x),\text{numer};B:\text{map}(\log,y),\text{numer};$

(%o5) [ 0 , 0.69314718055995 , 1.09861228866811 , 1.386294361119891 ,  
1.6094379124341 ]

(%o6) [ 1.791759469228055 , 1.945910149055313 , 2.079441541679836 ,  
2.19722457733622 , 2.302585092994046 ]

(%i7)  $C:\text{map}(\log,x*y),\text{numer};$

(%o7) [ 1.791759469228055 , 2.639057329615258 , 3.178053830347946 ,  
3.58351893845611 , 3.912023005428146 ]

(%i8)  $A+B;$

(%o8) [ 1.791759469228055 , 2.639057329615258 , 3.178053830347945 ,  
3.58351893845611 , 3.912023005428146 ]

# Rechenregeln für Logarithmen

## Tabellarische Ausgabe

```
(%i9) matrix(
["x","y","x*y","log x","log y","log x*y","log x + log y"],
[transpose(x),transpose(y),transpose(x*y),transpose(A),transpose(B),transpose(C),t
ranspose(A+B)]
);
```

```
(%o9)
```

x	y	x*y	log x	log y	log x*y	log x + log y
1	6	6	0	1.791759469228055	1.791759469228055	1.791759469228055
2	7	14	0.69314718055995	1.945910149055313	2.639057329615258	2.639057329615258
3	8	24	1.09861228866811	2.079441541679836	3.178053830347946	3.178053830347945
4	9	36	1.386294361119891	2.19722457733622	3.58351893845611	3.58351893845611
5	10	50	1.6094379124341	2.302585092994046	3.912023005428146	3.912023005428146

REGEL:  $D = A - B$

bedeutet  $\log(x/y) = \log(x) - \log(y)$

```
(%i10) D:map(log,x/y),numer;
```

```
(%o10) [ - 1.791759469228055 , - 1.252762968495368 , - 0.98082925301173 , -
0.81093021621633 , - 0.69314718055995 ]
```

```
(%i11) A-B;
```

```
(%o11) [ - 1.791759469228055 , - 1.252762968495368 , - 0.98082925301173 , -
0.81093021621633 , - 0.69314718055995 ]
```

# Rechenregeln für Logarithmen

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(%i12) matrix(  
["x","y","x/y","log x","log y","log x/y","log x - log y"],  
[transpose(x),transpose(y),transpose(1.0\*x/y),transpose(A),transpose(B),transpose  
(D),transpose(A-B)]  
);

(%o12)

$x$	$y$	$x/y$	$\log x$	$\log y$	$\log x/y$	$\log x - \log y$
1	6	0.166666666666667	0	1.791759469228055	- 1.791759469228055	- 1.791759469228055
2	7	0.28571428571429	0.69314718055995	1.945910149055313	- 1.252762968495368	- 1.252762968495368
3	8	0.375	1.09861228866811	2.079441541679836	- 0.98082925301173	- 0.98082925301173
4	9	0.444444444444444	1.386294361119891	2.19722457733622	- 0.81093021621633	- 0.81093021621633
5	10	0.5	1.6094379124341	2.302585092994046	- 0.69314718055995	- 0.69314718055995

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