

Grenzwerte von Funktionen

```
*****
Dokumentnummer: D1123
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      Funktionen
*****
```



FUNKTION 1

```
(%i1) F1:(x+1)/(x-1);
(%o1)  $\frac{x+1}{x-1}$ 
```

```
(%i2) 'limit(F1,x,inf)=limit(F1,x,inf);
(%o2)  $\lim_{x \rightarrow \infty} \frac{x+1}{x-1} = 1$ 
```

FUNKTION 2

```
(%i3) F2:F1**x;
(%o3)  $\left(\frac{x+1}{x-1}\right)^x$ 
```

```
(%i4) 'limit(F2,x,inf)=limit(F2,x,inf);
(%o4)  $\lim_{x \rightarrow \infty} \left(\frac{x+1}{x-1}\right)^x = e^2$ 
```

FUNKTION 3

```
(%i5) F3:(1+1/x)**sqrt(x);
(%o5)  $\left(\frac{1}{x}+1\right)^{\sqrt{x}}$ 
```

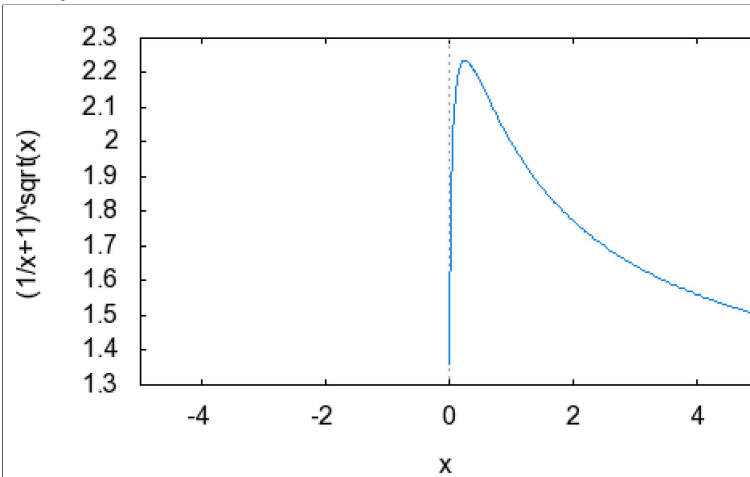
```
(%i6) 'limit(F3,x,inf)=limit(F3,x,inf);
(%o6)  $\lim_{x \rightarrow \infty} \left(\frac{1}{x}+1\right)^{\sqrt{x}} = 1$ 
```

Grafik dazu

```
(%i7) wxplot2d([F3], [x, -5, 5]);
```

plot2d: expression evaluates to non-numeric value somewhere in plotting range

```
(%t7)
```



```
(%o7)
```

FUNKTION 4

```
(%i8) F4: (x-1-log(x))/(x-1)**2;
```

```
(%o8) 
$$\frac{-\log(x)+x-1}{(x-1)^2}$$

```

```
(%i9) 'limit(F4,x,inf)=limit(F4,x,inf);
```

```
(%o9) 
$$\lim_{x \rightarrow \infty} \frac{-\log(x)+x-1}{(x-1)^2} = 0$$

```

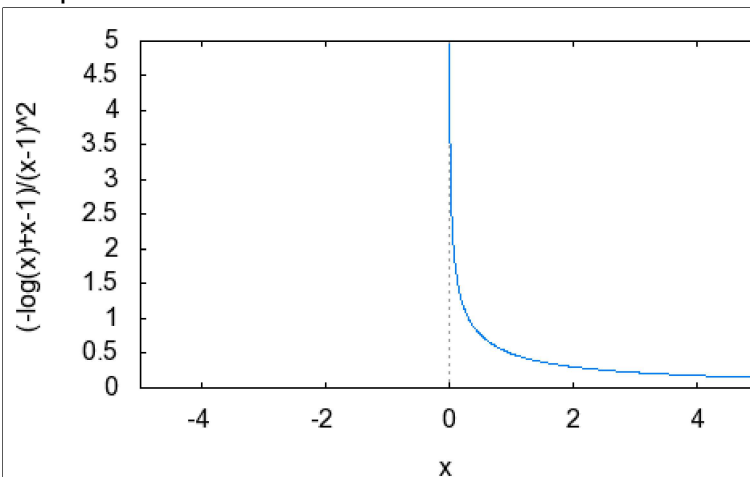
Anmerkung: $x=1$ ist offenbar eine behebbare Unstetigkeitsstelle

Grafik dazu

```
(%i10) wxplot2d([F4], [x, -5, 5]);
```

plot2d: expression evaluates to non-numeric value somewhere in plotting range

```
(%t10)
```



```
(%o10)
```