

Computergestuetzte Mathematik zur Analysis

Lektion 1

Maple rechnet symbolisch

```
> 2/7;  
> (2/7)^49;  
> 70!;  
> 70!/2^70;  
> 2/7; 1/2: 3/2; #Trennzeichen
```

und numerisch mit beliebiger Praezision

```
> evalf(2/7);  
> evalf(2/7, 800); # 800 Stellen  
> evalf(Pi, 800);
```

Zuordnung / Namen

```
> f := (a - b)^2;  
> a := 5; b := 7;  
> f;  
> a := 'a':  
> f;  
> polynom_in_a := f = 0;
```

Achtung! Reihenfolge!

```
> restart;  
> a := 5; b := 7;  
> f := (a - b)^2;  
> a := 'a':  
> f;
```

Polynome und rationale Funktionen

```
> P:= (x^2 + 2*x +1);  
> Q := x+1;  
> P/Q;  
> simplify( ); # Ctrl + L  
> factor( );
```

Vereinfachungen spaeter

Konstanten

```
[> Pi; gamma; Catalan;
> evalf(Catalan);
> constants;
```

Elementare Funktionen

```
[> Pi;
> sin(Pi/2);
> cos(Pi);
> tan(Pi/2);
> arccot(1);
> exp(1);
> log(exp(1));
```

Summen

```
[> sum(j, j = 0 .. n);
> normal(%);
> sum(j^2, j = 0 .. n);
> normal(%);
> sum(q^j, j = 1 .. n);
> normal(%);
> sum(1/j^2, j = 1 .. infinity);
> sum((-1)^(j+1) / j, j = 1 .. infinity);
```

Achtung !

```
[> sum(q^n, n = 0 .. infinity);
> sum(4^n, n = 0 .. infinity);
```

Grenzwerte

```
[> a := (9*x^2 - 5)/(x-2)/(x+3);
> limit(a, x = infinity);
> b := n!/n^n*exp(n)/sqrt(n);
> limit(b, n = infinity);
```

Integrale

```
[> f := 1/(7+t^2);
> int(f, t);
> diff(,t);
> diff(?,t); # Insert Label (Referenz einfüegen) "strg/control
L"
> simplify(?);
```

```
LL> int(exp(-x^2), x = -infinity .. infinity);
```

▼ **Hilfe!**

```
[> ?
```