Computergestuetzte Mathematik zur Analysis

Lektion 4

Listen und Mengen

```
> liste := [a, b, c];
```

$$liste := [a, b, c] \quad (1.1)$$

```
> menge := {C, B, A, B, C};
```

$$menge := \{A, B, C\} \quad (1.2)$$

```
> folge := X, Y, Z;
```

$$folge := X, Y, Z \quad (1.3)$$

```
> liste[2];
```

$$b \quad (1.4)$$

```
> menge[3];
```

$$C \quad (1.5)$$

Aber Achtung mit der Reihenfolge!

```
> folge[1];
```

$$X \quad (1.6)$$

```
> convert(liste, set);
```

$$\{a, b, c\} \quad (1.7)$$

```
> convert(menge, list);
```

$$[A, B, C] \quad (1.8)$$

```
> [folge];
```

$$[X, Y, Z] \quad (1.9)$$

```
> {folge};
```

$$\{X, Y, Z\} \quad (1.10)$$

```
> seq(j^2, j = 1 .. 5);
```

$$1, 4, 9, 16, 25 \quad (1.11)$$

```
> [%];
```

$$[1, 4, 9, 16, 25] \quad (1.12)$$

```
> nops(%);
```

$$5 \quad (1.13)$$

Op / Map / Apply

```
> u := [a, b, c];
```

$$u := [a, b, c] \quad (2.1)$$

```
> a := x^2+y^(1/2)+sin(z);
```

(2.2)

$$a := x^2 + \sqrt{y} + \sin(z) \quad (2.2)$$

```
> nops(u);
```

$$3 \quad (2.3)$$

```
> nops(a);
```

$$3 \quad (2.4)$$

```
> op(1, a);
```

$$x^2 \quad (2.5)$$

```
> u;
```

$$[x^2 + \sqrt{y} + \sin(z),\ b,\ c] \quad (2.6)$$

```
> op(1, u);
```

$$x^2 + \sqrt{y} + \sin(z) \quad (2.7)$$

```
> op(2 .. 3, u);
```

$$b,\ c \quad (2.8)$$

```
> op(1, op(1, u));
```

$$x^2 \quad (2.9)$$

Mehr zu Maple Operatoren

```
> ex1 := x^2-y*z*sin(v)+(1/2)*Pi+int(g(x),x=0..1);
```

$$ex1 := x^2 - y\,z\sin(v) + \frac{1}{2}\,\pi + \int_0^1 g(x)\,dx \quad (2.1.1)$$

```
> op(ex1);
```

$$x^2,\ -y\,z\sin(v),\ \frac{1}{2}\,\pi,\ \int_0^1 g(x)\,dx \quad (2.1.2)$$

```
> whattype(ex1);
```

$$`+` \quad (2.1.3)$$

```
> op(2, ex1);
```

$$-y\,z\sin(v) \quad (2.1.4)$$

```
> whattype(op(2, ex1));
```

$$`*` \quad (2.1.5)$$

```
> op(1, op(2, ex1));
```

$$-1 \quad (2.1.6)$$

```
> op(4, op(2, ex1));
```

$$\sin(v) \quad (2.1.7)$$

```
> whattype(op(4, op(2, ex1)));
```

function (2.1.8)

```
> whattype(op(2, op(2, ex1)));
```

symbol (2.1.9)

```
> f := x -> x^2;
```

$$f := x \to x^2 \tag{2.10}$$

```
> map(f, liste);
```

$$\left[\left(x^2 + \sqrt{y} + \sin(z)\right)^2, b^2, c^2\right] \tag{2.11}$$

```
> map(f, menge);
```

$$\{A^2, B^2, C^2\} \tag{2.12}$$

Fehlerquelle:

```
> map(sin, folge);
Error, (in sin) expecting 1 argument, got 3
> map(sin, [folge]);
```

$$[\sin(X), \sin(Y), \sin(Z)] \tag{2.13}$$