

Rundgang in *Mathematica*

■ Tour en *Mathematica*

(Nach Ideen aus: Handbuch "*Mathematica*" von S. Wolfram)

■ (Selon les idées prises dans le manuel "*Mathematica*" de S. Wolfram)

Run mit WIN+*Mathematica* Version 5.2

■ Testé avec *Mathematica* version 5.2+WIN

10. *Mathematica* Packages

■ *Mathematica* Packages

Beispiel: Laplace-Transformationen

■ Exemple: Transformations de Laplace

Package laden

■ Charger le Package

```
(* Old versions:
<<Calculus`LaplaceTransform` *)
```

Eine Transformierte rechnen

■ Calculer une transformée

```
LaplaceTransform[t^n Exp[-c/t], t, s]
```

$$2 \left(\frac{s}{c} \right)^{\frac{1}{2} (-1-n)} \text{BesselK} \left[-1 - n, \frac{2 \sqrt{s}}{\sqrt{\frac{1}{c}}} \right]$$

Beispiel: Padé-Approximation

■ Exemple: Approximation de Padé

Package laden (neuer Kern benutzen!)

Charger le Package (employer un nouveau kernel!)

```
<<Calculus`Pade`
```

Eine Approximation rechnen

■ Calculer une approximation

```
Pade[Exp[Sin[x]],{x, 0, 2, 3}]
```

$$\frac{1 + \frac{8x}{15} + \frac{x^2}{4}}{1 - \frac{7x}{15} + \frac{13x^2}{60} + \frac{x^3}{60}}$$

Beispiel aus der Statistik

■ Exemple de la statistique

Package laden

■ Charger le Package

```
<<Statistics`DescriptiveStatistics`
```

Einige Kenngrößen rechnen

■ Calculer quelques valeurs spécifiques

```
LocationReport[Table[Random[],{1000}]]
```

```
{Mean → 0.496287, HarmonicMean → 0.143913, Median → 0.51231}
```

Beispiel: Permutationen

■ Exemple: Permutations

Package laden

■ Charger le Package

```
(* Old versions: <<DiscreteMath`Permutations` *)
```

```
<< DiscreteMath`Combinatorica`
```

Zufällige Permutation erzeugen

■ Créer une permutation par le hazard

```
RandomPermutation[20]
```

```
{12, 16, 5, 20, 11, 1, 17, 9, 8, 3, 10, 18, 4, 13, 7, 6, 14, 19, 2, 15}
```

Zyklische Zerlegung

■ Décomposition cyclique

```
ToCycles[%]
```

```
{{12, 18, 19, 2, 16, 6, 1}, {5, 11, 10, 3}, {20, 15, 7, 17, 14, 13, 4}, {9, 8}}
```

Beispiel aus der Chemie

■ Exemple pris de la chimie

Package laden

■ Charger le Package

```
<<Miscellaneous`ChemicalElements`
```

```
Titanium::shdw : Symbol Titanium appears in multiple contexts  
{Miscellaneous`ChemicalElements`, Graphics`Colors`}; definitions in context  
Miscellaneous`ChemicalElements` may shadow or be shadowed by other definitions. Mehr...
```

```
Cobalt::shdw : Symbol Cobalt appears in multiple contexts  
{Miscellaneous`ChemicalElements`, Graphics`Colors`}; definitions in context  
Miscellaneous`ChemicalElements` may shadow or be shadowed by other definitions. Mehr...
```

```
Zinc::shdw :  
Symbol Zinc appears in multiple contexts {Miscellaneous`ChemicalElements`, Graphics`Colors`}; definitions  
in context Miscellaneous`ChemicalElements` may shadow or be shadowed by other definitions. Mehr...
```

```
Gold::shdw :  
Symbol Gold appears in multiple contexts {Miscellaneous`ChemicalElements`, Graphics`Colors`}; definitions  
in context Miscellaneous`ChemicalElements` may shadow or be shadowed by other definitions. Mehr...
```

Ein Atomgewicht abrufen

■ Rappeler un poids atomique

```
?AtomicWeight
```

```
AtomicWeight[element] gives the atomic weight of the specified element. Mehr...
```

```
AtomicWeight[Tungsten]
```

```
183.84
```

Noch eines

■ Encore un

```
AtomicWeight[Plutonium]
```

```
AtomicWeight::unstable : No stable isotope of Plutonium exists.
```

```
244
```

Ausschalten der Ausgabe "unstable"

■ Eliminer la sortie "instable"

```
Off[AtomicWeight::unstable]
```

Atomnummer

■ Nombre atomique

```
AtomicNumber[Plutonium]
```

```
94
```

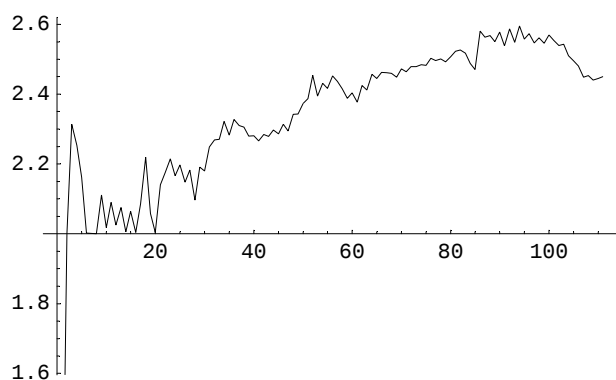
Verhältnis Gewicht zu Nummer

■ Corrélation entre poids et nombre

```
ListPlot[AtomicWeight[Elements]/AtomicNumber[
  Elements], PlotJoined->True];
```

```
AtomicWeight::unknown : The atomic weight of Ununbium is not known.
```

```
Graphics::gptn : Coordinate  $\frac{\text{Unknown}}{112}$  in  $\{112, \frac{\text{Unknown}}{112}\}$  is not a floating-point number. Mehr...
```



Beispiel: Sternform eines Platonischen Körpers

■ Exemple: Forme d'étoile d'un corps platonique

Package laden

■ Charger le Package

```
<<Graphics`Polyhedra`
```

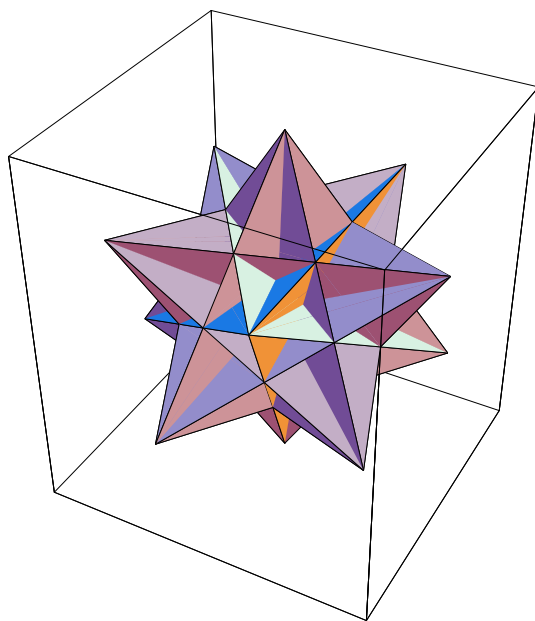
```
Vertices::shdw :
```

```
Symbol Vertices appears in multiple contexts {Geometry`Polytopes`, DiscreteMath`Combinatorica`};  
definitions in context Geometry`Polytopes` may shadow or be shadowed by other definitions. Mehr...
```

Sternform des Ikosaeders

■ Forme d'étoile de l'icosaèdre

```
Show[Polyhedron[GreatIcosahedron]];
```



"Putzmaschine" einsetzen

■ Employer la "machine de nettoyage"

```
(* Old Form: Remove["Global`*"] *)
```

```
Remove["Global`*"]
```