

Diverse Hinweise, Tipps und Tricks im Umgang mit Mathematica

Partielle Ableitungen

```
In[1]:= g[x_, t_] = x^3 Sin[a t]
```

```
Out[1]= x^3 Sin[a t]
```

entweder so

```
In[2]:= D[g[x, t], x, x]
```

```
Out[2]= 6 x Sin[a t]
```

oder so

```
In[3]:= Derivative[2, 0][g][x, t]
```

```
Out[3]= 6 x Sin[a t]
```

oder so

```
In[4]:= D[g[x, t], {x, 2}]
```

```
Out[4]= 6 x Sin[a t]
```

oder auch so

```
In[5]:= D[g[x, t], {x, 2}]
```

```
Out[5]= 6 x Sin[a t]
```

Parameter lokal definieren

```
In[6]:= g[x, t] /. a -> Pi
```

```
Out[6]= x^3 Sin[Pi t]
```

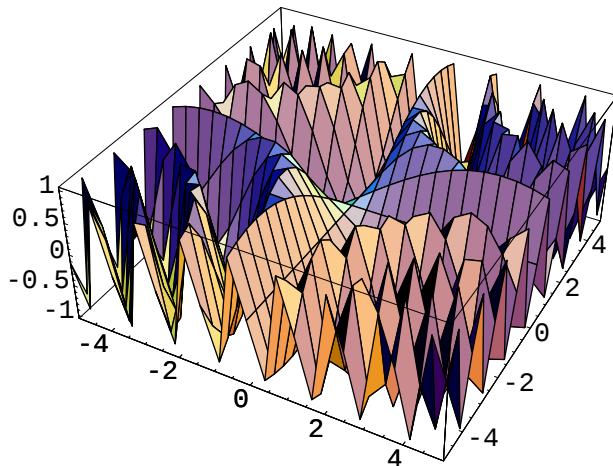
oder anders

```
In[7]:= parameter = {a -> Pi};  
g[x, t] /. parameter
```

```
Out[8]= x^3 Sin[Pi t]
```

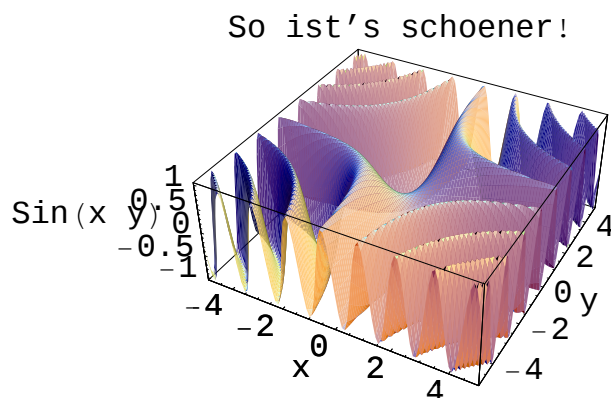
Plots und mehr

```
In[9]:= Plot3D[Sin[x y], {x, -5, 5}, {y, -5, 5}];
```



Bessere Auflösung und ohne Gitterlinien aber mit weiterer Kosmetik:

```
In[10]:= Plot3D[Sin[x y], {x, -5, 5}, {y, -5, 5},  
  PlotPoints → 100, Mesh → False, AxesLabel → {x, y, "Sin(x y)"},  
  PlotLabel → "So ist's schoener!", TextStyle → {FontSize → 12}];
```

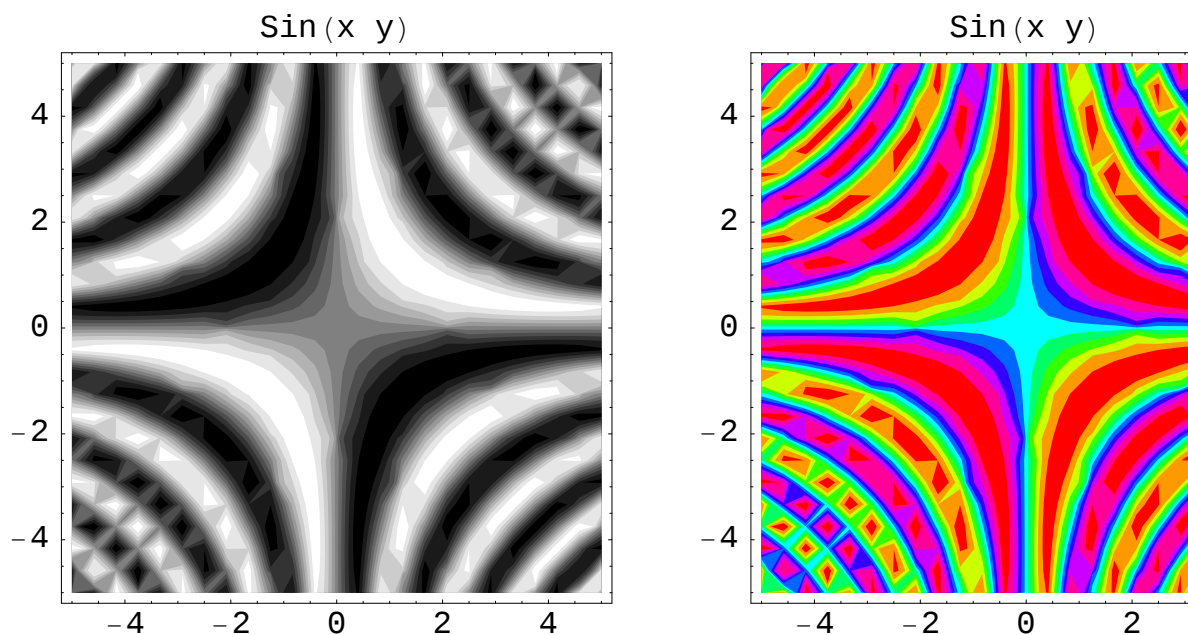


Oder als ContourPlot (in Schwarzweiss und Farbe):

```

In[11]:= contour1 = ContourPlot[Sin[x y], {x, -5, 5}, {y, -5, 5}, PlotLabel -> "Sin(x y)",
    TextStyle -> {FontSize -> 12}, ContourLines -> False, DisplayFunction -> Identity];
contour2 = ContourPlot[Sin[x y], {x, -5, 5}, {y, -5, 5}, PlotLabel -> "Sin(x y)",
    TextStyle -> {FontSize -> 12}, ContourLines -> False,
    ColorFunction -> Hue, DisplayFunction -> Identity];
Show[GraphicsArray[{contour1, contour2}], ImageSize -> 72 9];

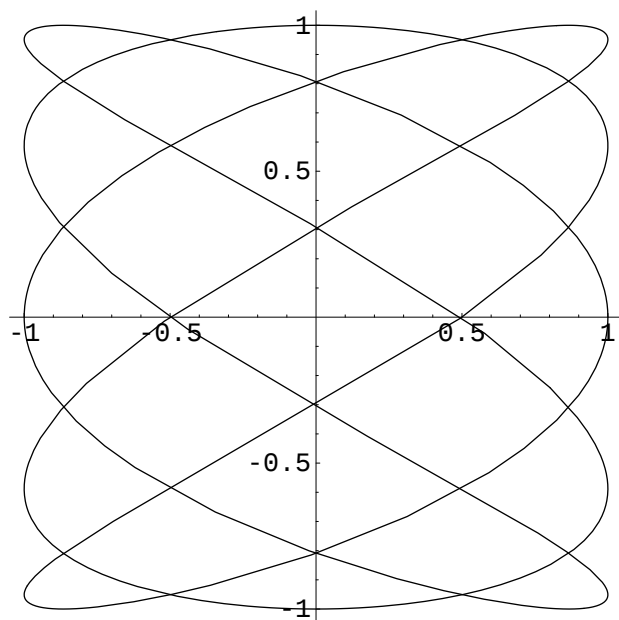
```



```

In[14]:= f1[t_] = Cos[5 t];
f2[t_] = Sin[3 t];
f3[t_] = Sin[t];
ParametricPlot[{f1[t], f2[t]}, {t, 0, 2 π}, AspectRatio -> Automatic];

```



```

In[18]:= parametric1 = ParametricPlot3D[{f1[t], f2[t], f3[t]}, {t, 0, 2  $\pi$ },
  AspectRatio  $\rightarrow$  Automatic, ViewPoint  $\rightarrow$  {1, -1, 2}, DisplayFunction  $\rightarrow$  Identity];
parametric2 = ParametricPlot3D[{f1[t], f2[t], f3[t]}, {t, 0, 2  $\pi$ },
  AspectRatio  $\rightarrow$  Automatic, ViewPoint  $\rightarrow$  {1, 0, 0}, DisplayFunction  $\rightarrow$  Identity];
Show[GraphicsArray[{parametric1, parametric2}], ImageSize  $\rightarrow$  729];

```

