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]:= ∂x,x g[x, t]

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

oder auch so

```
In[5]:= ∂{x,2} g[x, t]

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

Parameter lokal definieren

```
In[6]:= g[x, t] /. a → Pi

Out[6]= x^3 Sin[π t]
```

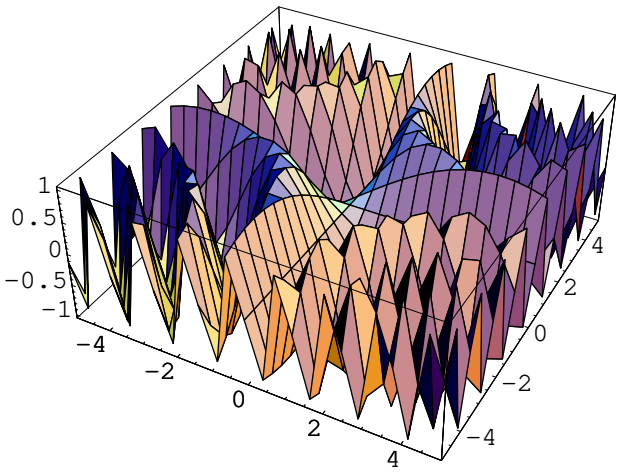
oder anders

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

Out[8]= x^3 Sin[π t]
```

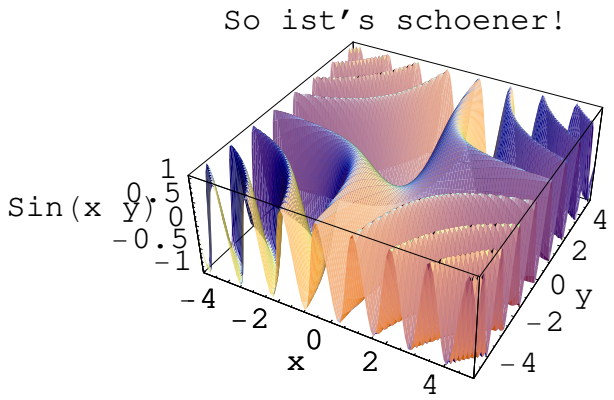
Plots und mehr

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



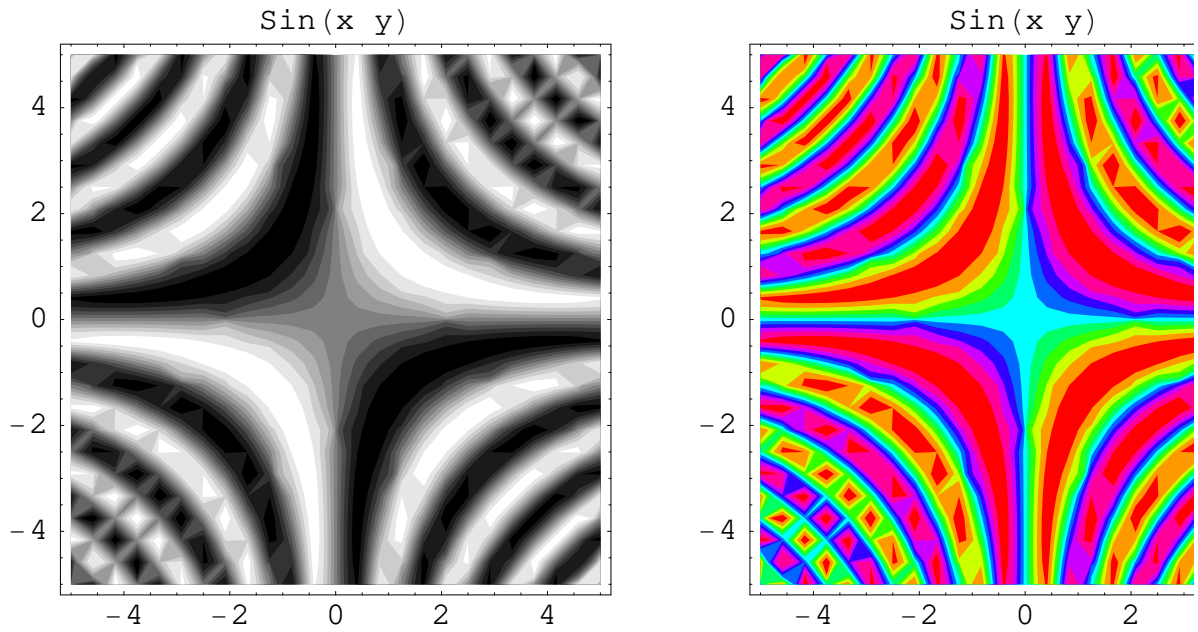
Bessere Aufloesung und ohne Gitterlinien aber mit weiterer Kosmetik:

```
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}];
```

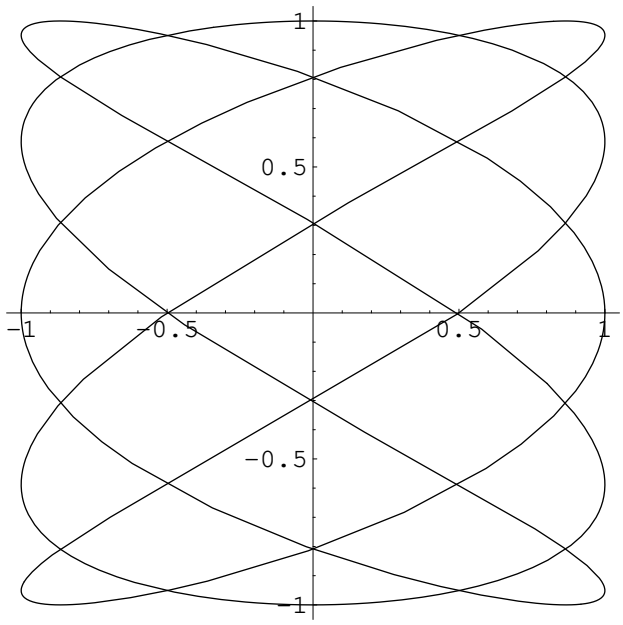
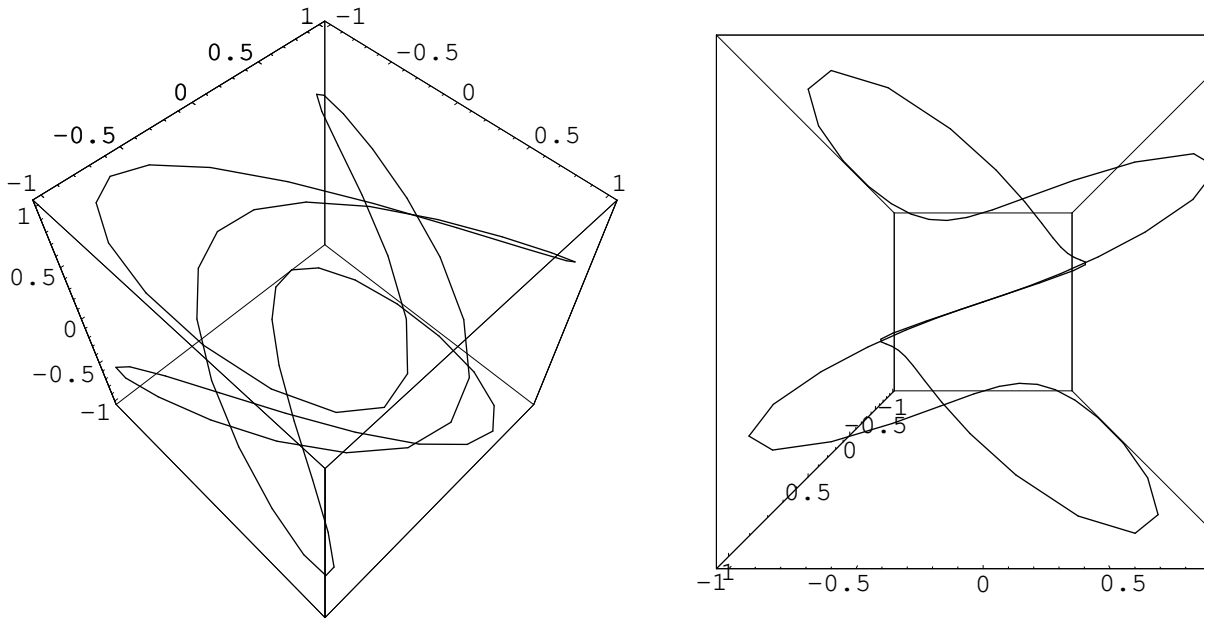


Oder als ContourPlot (in Schwarzweiss und Farbe):

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 π},
           AspectRatio → Automatic, ViewPoint -> {1, -1, 2}, DisplayFunction → Identity];
         parametric2 = ParametricPlot3D[{f1[t], f2[t], f3[t]}, {t, 0, 2 π},
           AspectRatio → Automatic, ViewPoint -> {1, 0, 0}, DisplayFunction → Identity];
         Show[GraphicsArray[{parametric1, parametric2}], ImageSize → 72 9];
```