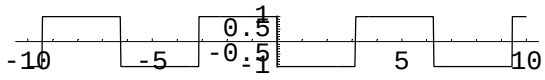
Interessante Plots 2D und 3D

2D

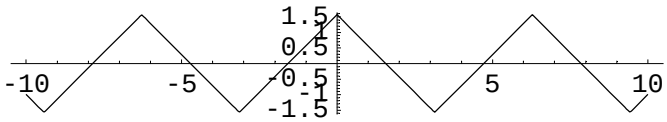
```
D[ArcSin[Cos[x]], x]
```

$$-\frac{\text{Sin}[x]}{\sqrt{1-\text{Cos}[x]^2}}$$

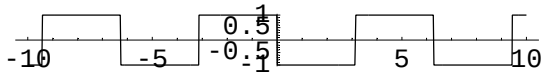
```
Plot[-Sin[x]/Sqrt[1-Cos[x]^2],{x,-10,10},AspectRatio→Automatic];
```



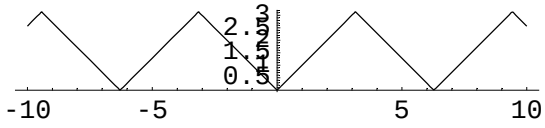

```
Plot[ArcSin[Cos[x]], {x, -10, 10}, AspectRatio → Automatic];
```



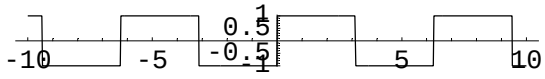

```
Plot[Evaluate[D[ArcSin[Cos[x]], x]], {x, -10, 10},
  AspectRatio → Automatic];
```



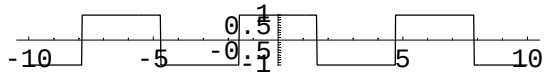

```
Plot[ArcCos[Cos[x]], {x, -10, 10}, AspectRatio → Automatic];
```



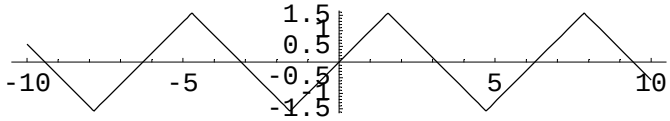

```
Plot[Evaluate[D[ArcCos[Cos[x]], x]], {x, -10, 10},
  AspectRatio → Automatic];
```



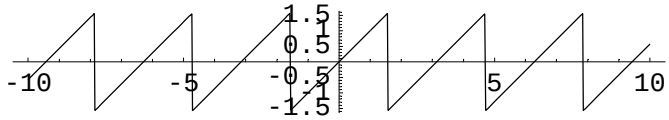
```
Plot[Evaluate[D[ArcSin[Sin[x]], x]], {x, -10, 10},
  AspectRatio → Automatic];
```



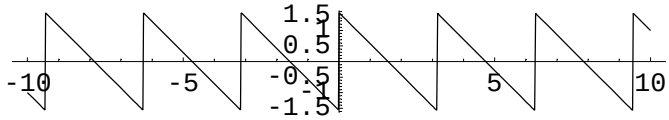

```
Plot[ ArcSin[Sin[x]], {x, -10, 10}, AspectRatio → Automatic];
```



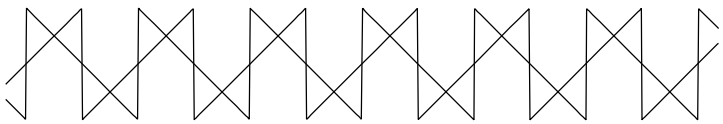

```
Plot[ ArcTan[Tan[x]], {x, -10, 10}, AspectRatio → Automatic];
```



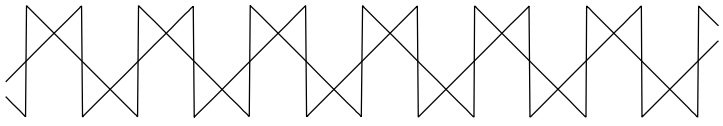

```
Plot[ ArcTan[Cot[x]], {x, -10, 10}, AspectRatio → Automatic];
```



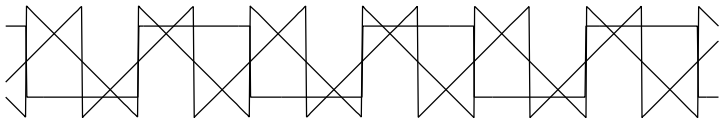

```
Plot[{ ArcTan[Cot[x]]  ArcTan[Tan[x]] }, {x, -10, 10},
 AspectRatio → Automatic, Axes → False];
```



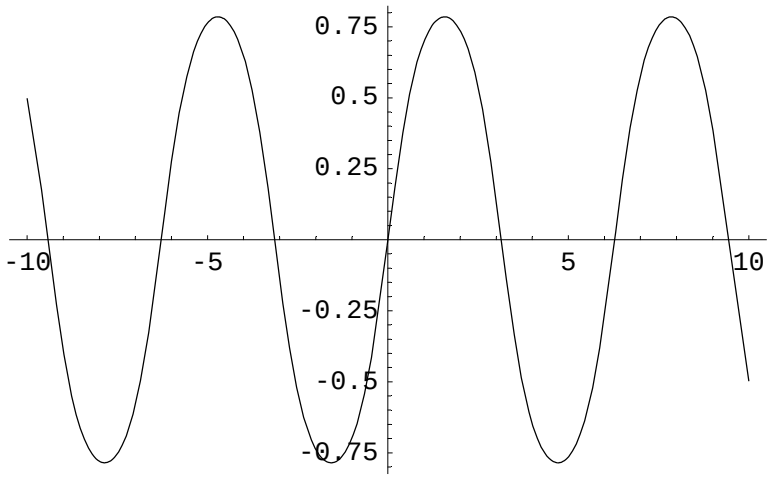
```
Plot[{ArcTan[Cot[x]], ArcTan[Tan[x]]}, {x, -10, 10},
  AspectRatio → Automatic, Axes → False];
```



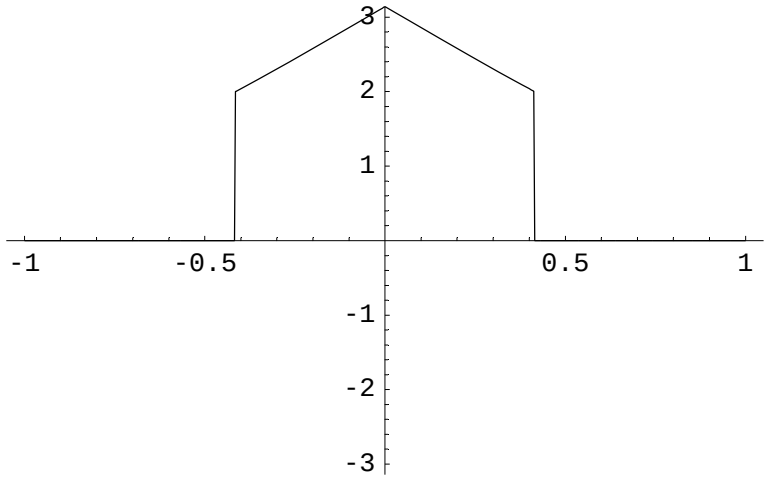
```
Plot[{ArcTan[Cot[x]], ArcTan[Tan[x]], Sin[x] / Sqrt[1 - Cos[x]^2]},
  {x, -10, 10}, AspectRatio → Automatic, Axes → False];
```



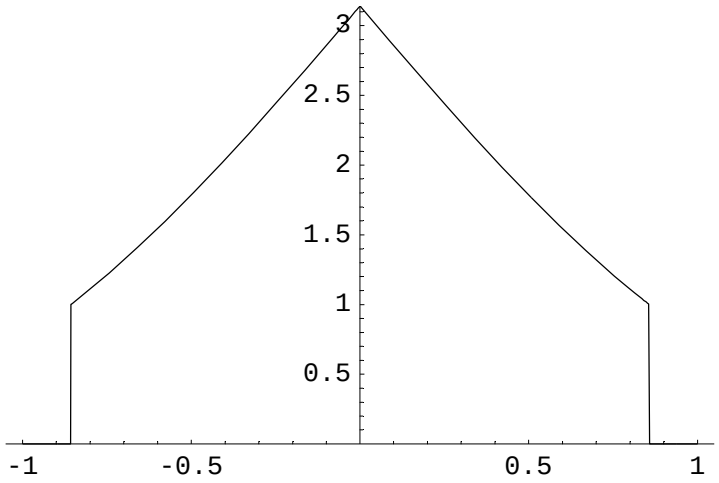
```
Plot[ArcTan[Sin[x]], {x, -10, 10}];
```



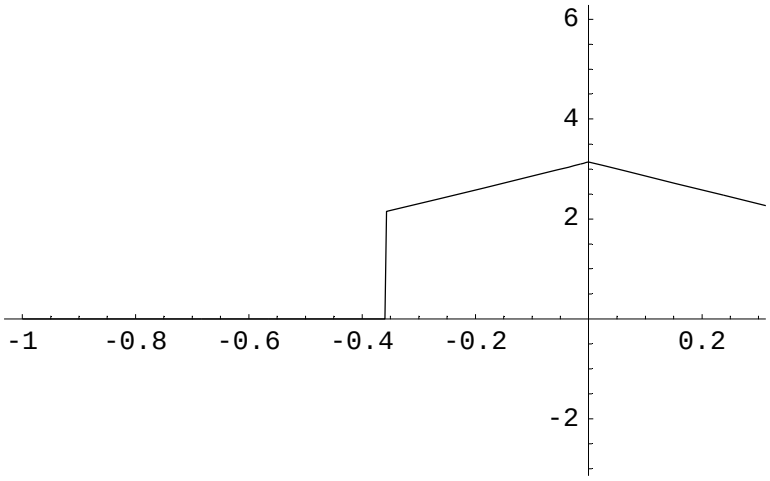

```
Plot[2 ArcSin[E^(-x^2)] * Sign[Floor[ ArcSin[E^(-x^2)] ]],
  {x, -1, 1}, PlotRange → {-Pi, Pi}];
```



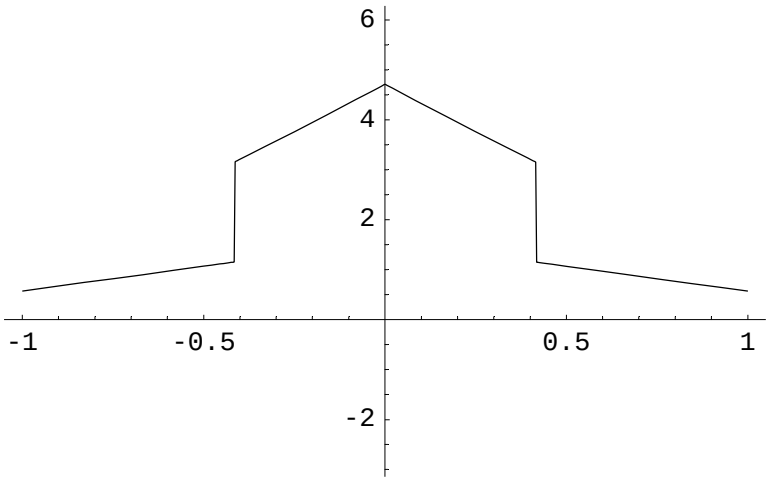

```
Plot[2 ArcSin[E^(-x^2)] * Sign[Floor[ 2 ArcSin[E^(-x^2)] ]],
  {x, -1, 1}, PlotRange → {0, Pi}];
```



```
Plot[2 ArcSin[E^(-x^2)] * Sign[Floor[ 2 ArcSin[E^(-(x - 0.5)^2)] ]],
  {x, -1, 1}, PlotRange → {-Pi, 2 Pi}];
```

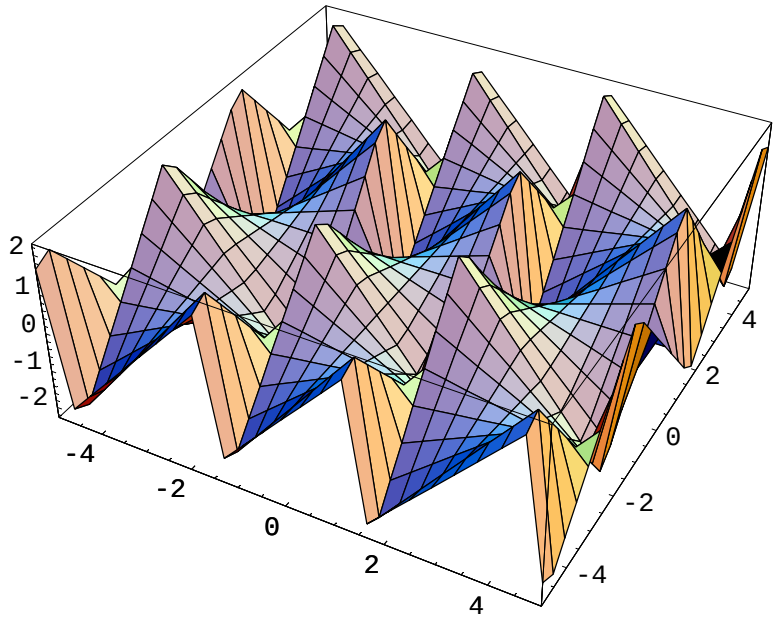



```
Plot[2 ArcSin[E^(-x^2)] * Sign[Floor[ ArcSin[E^(-x^2)] ]] +
   ArcSin[Cos[x]], {x, -1, 1}, PlotRange → {-Pi, 2 Pi}];
```

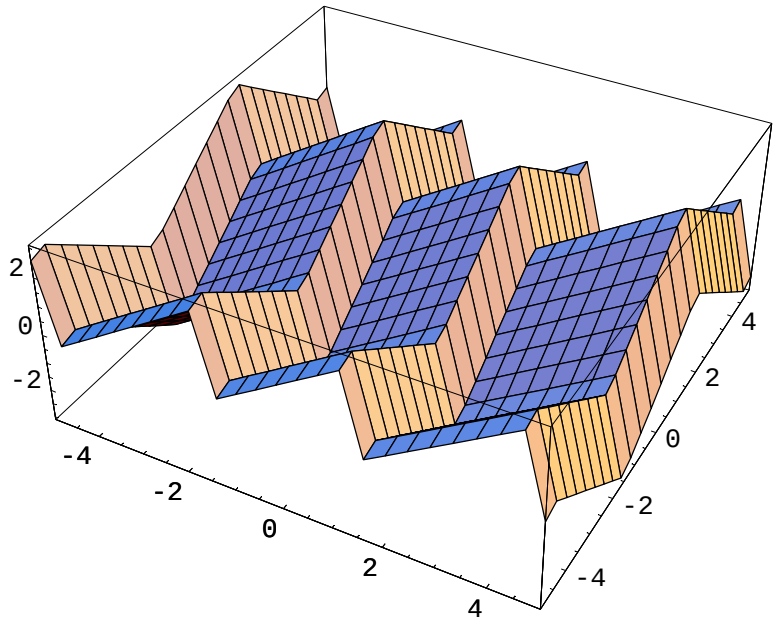


3D

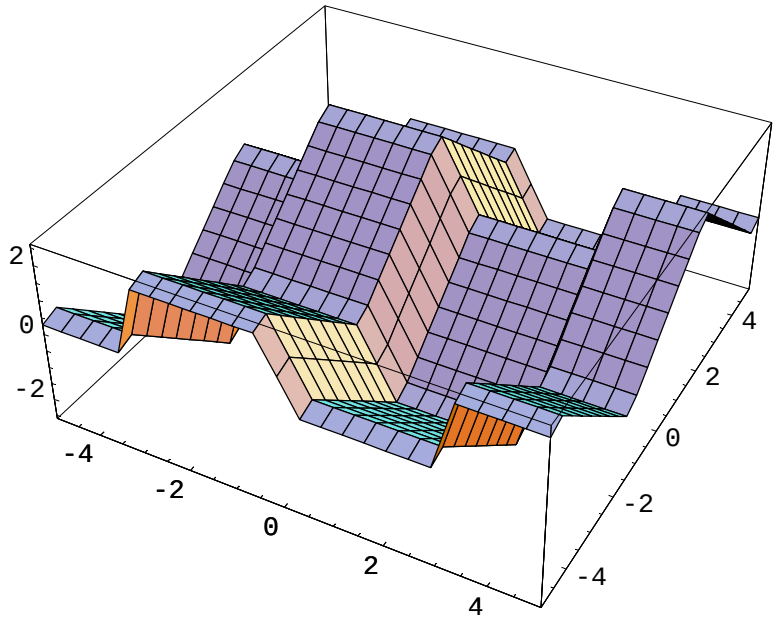
```
p0=Plot3D[ ArcTan[Tan[x]] ArcSin[Sin[y]],{x,-5,5},{y,-5,5}];
```



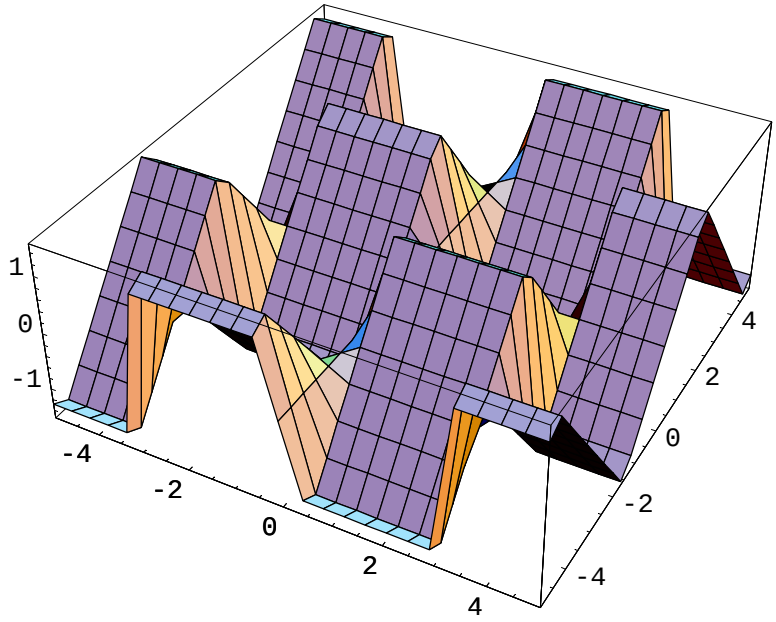

```
p0=Plot3D[ ArcTan[Tan[x]]+ArcSin[Sin[y]],{x,-5,5},{y,-5,5}];
```



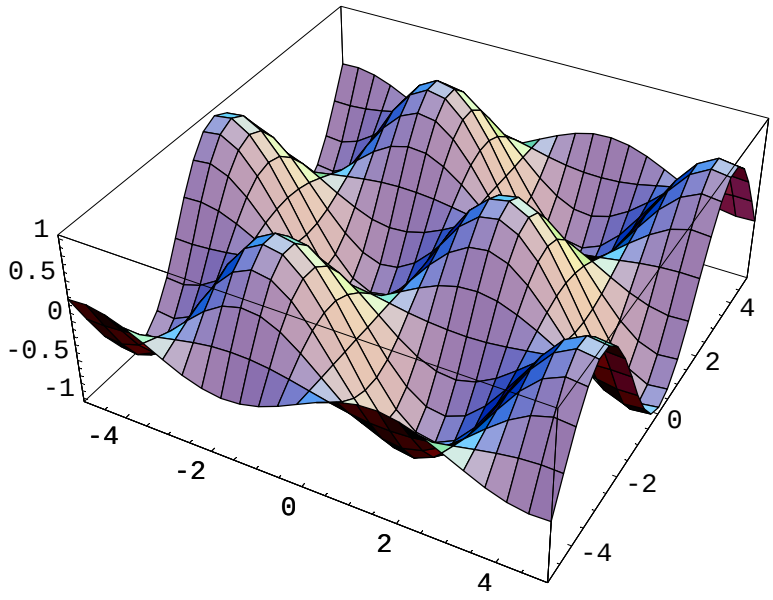
```
p0=Plot3D[-Sin[x]/Sqrt[1.0001-Cos[x]^2]+ArcSin[Sin[y]],{x,-5,5},{y,-5,
5}];
```



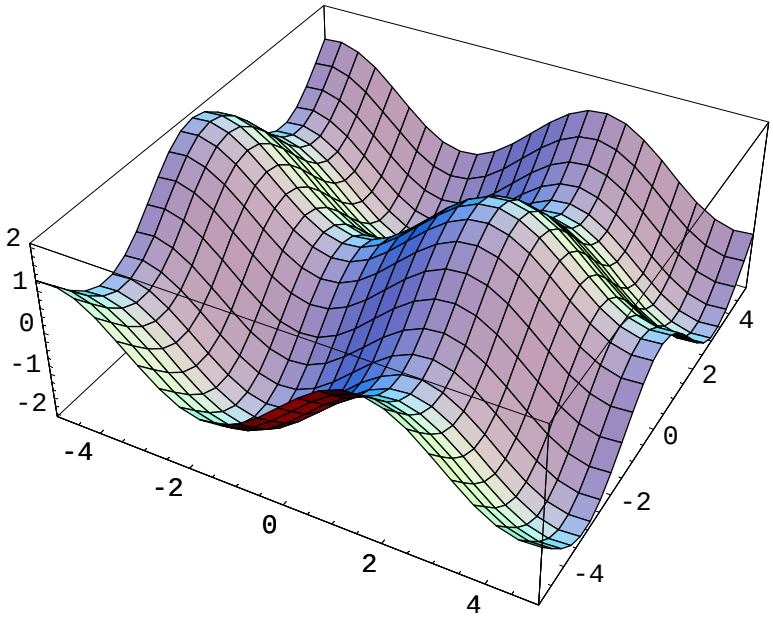

```
p0=Plot3D[-Sin[x]/Sqrt[1.0001-Cos[x]^2]
ArcSin[Sin[y]],{x,-5,5},{y,-5,5}];
```



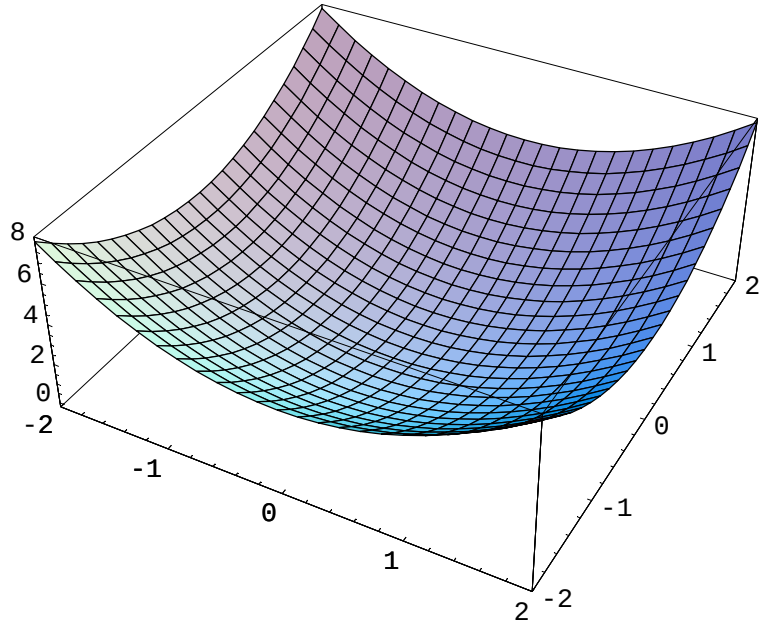
```
p0=Plot3D[ Sin[x] Cos[y],{x,-5,5},{y,-5,5}];
```



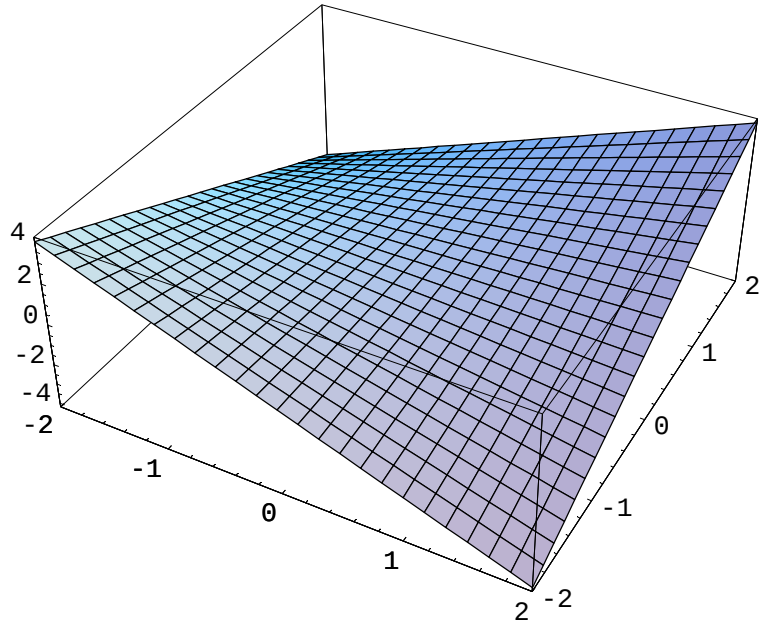

```
p0=Plot3D[ Sin[x]+Cos[y],{x,-5,5},{y,-5,5}];
```



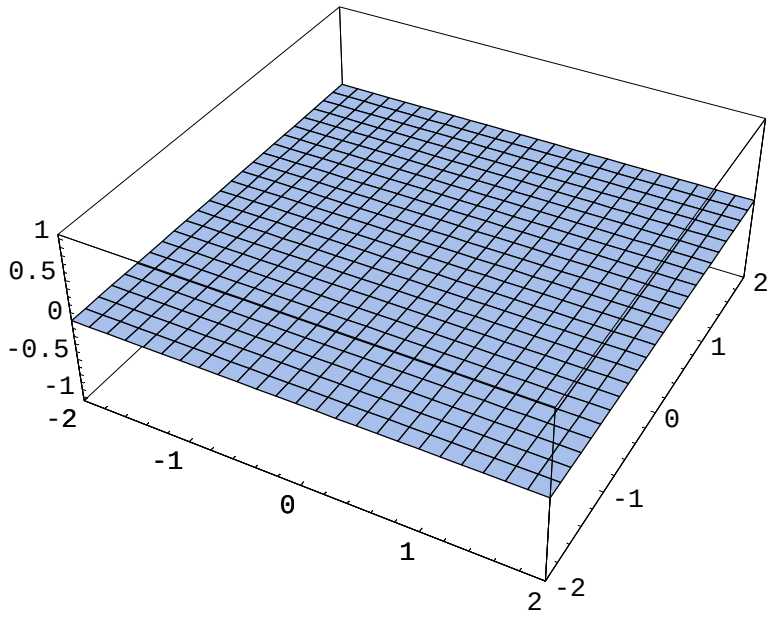
```
p1 = Plot3D[x^2 + y^2, {x, -2, 2}, {y, -2, 2}];
```



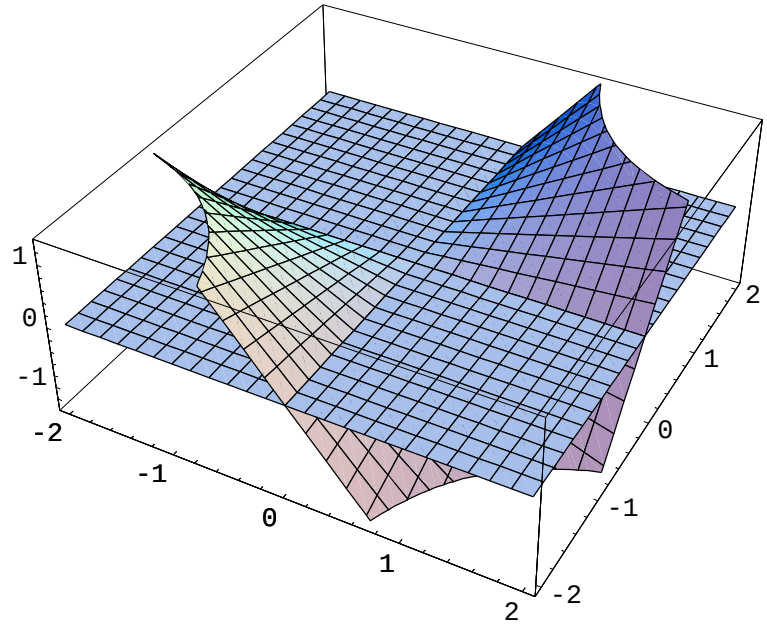

```
p2 = Plot3D[x y, {x, -2, 2}, {y, -2, 2}];
```



```
p3 = Plot3D[0, {x, -2, 2}, {y, -2, 2}];
```



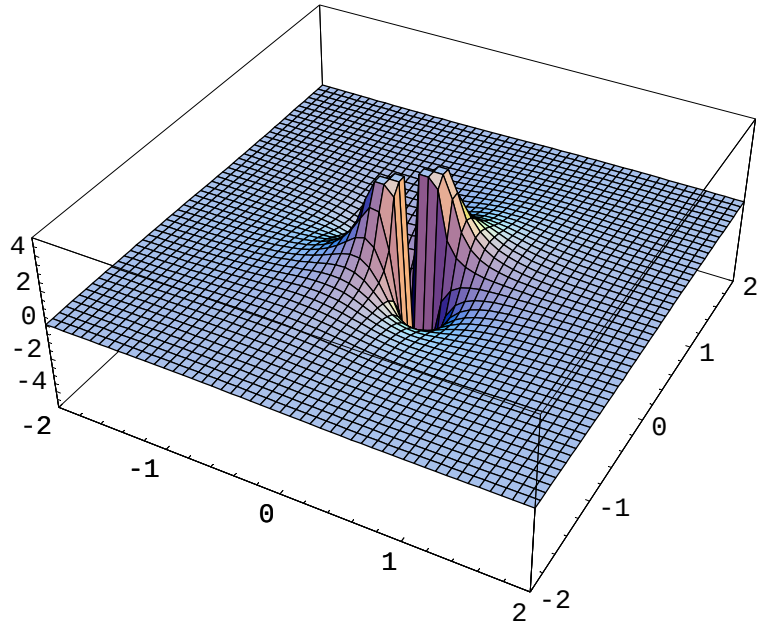

```
Show[p2, p3];
```



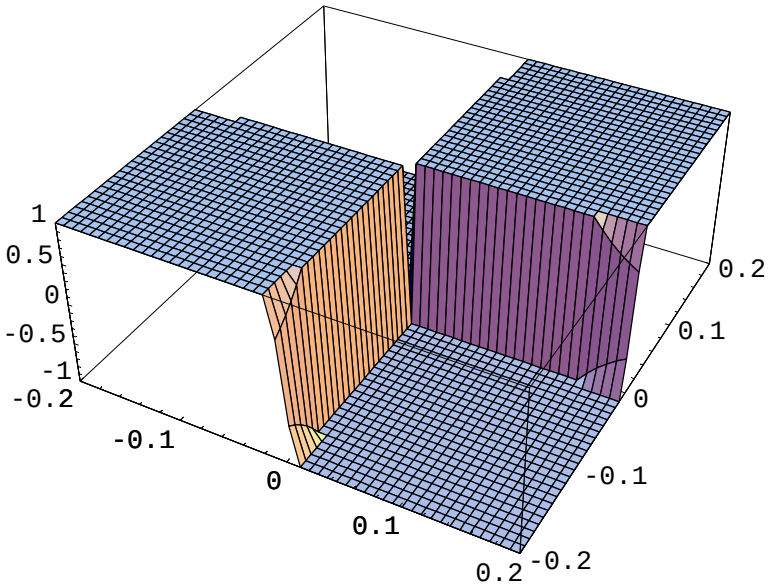

```
?PlotPoints
```

PlotPoints is an option for plotting functions that
specifies how many initial sample points to use. Mehr…

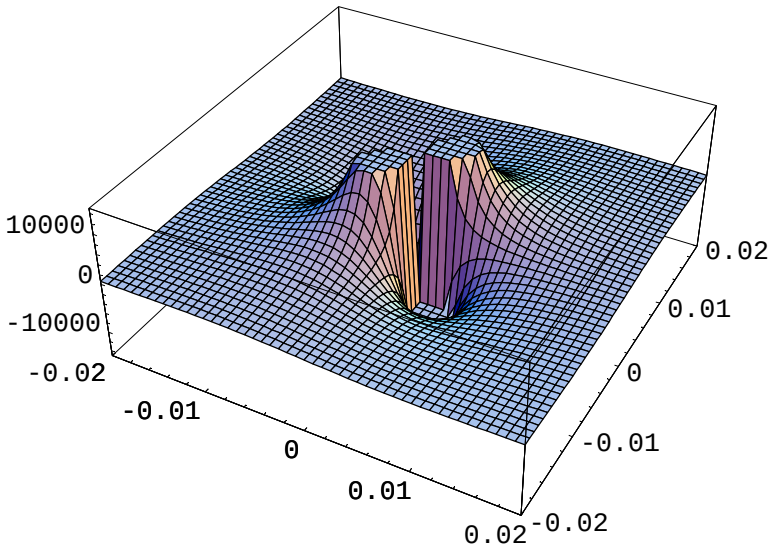
```
p4 = Plot3D[x y / (x^2 + y^2)^2, {x, -2, 2}, {y, -2, 2},
   PlotRange → {-5, 5}, PlotPoints → 50];
```



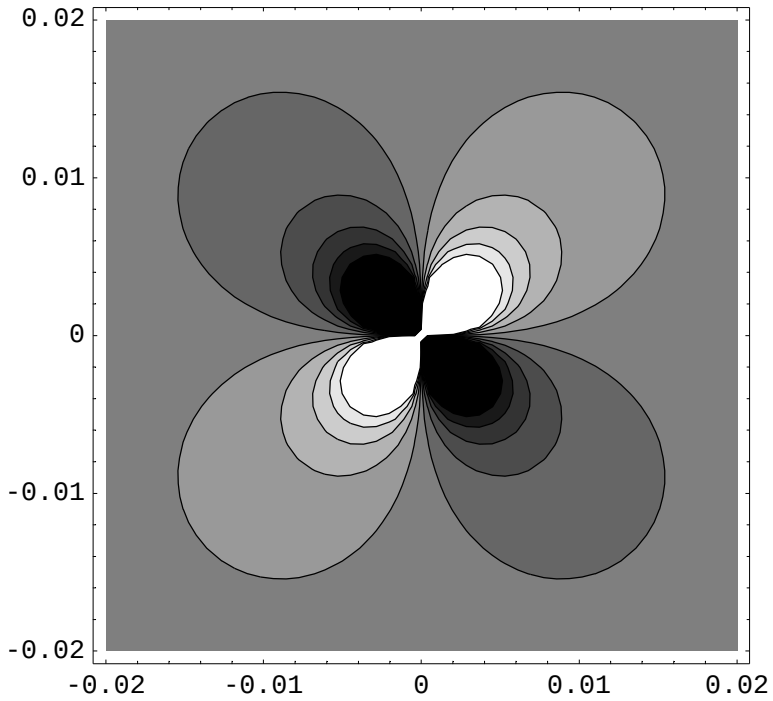

```
p4 = Plot3D[x y / (x^2 + y^2)^2, {x, -0.2, 0.2}, {y, -0.2, 0.2},
   PlotRange → {-1, 1}, PlotPoints → 50];
```



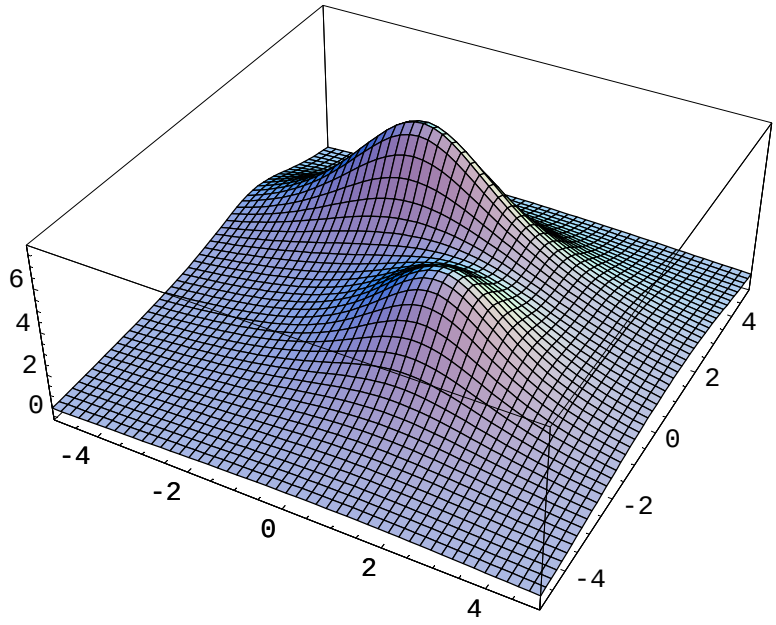
```
p4 = Plot3D[x y / (x^2 + y^2)^2, {x, -0.02, 0.02}, {y, -0.02, 0.02},
   PlotRange → {-15000, 15000}, PlotPoints → 50];
```



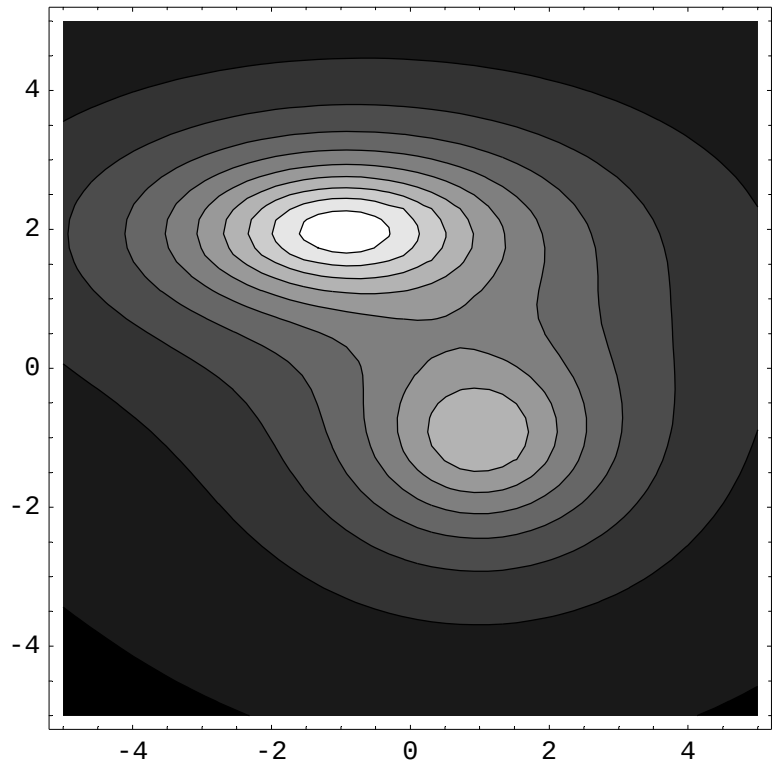

```
ContourPlot[x y / (x^2 + y^2)^2, {x, -0.02, 0.02}, {y, -0.02, 0.02},
  PlotRange → {-15000, 15000}, PlotPoints → 50];
```



```
p5 = Plot3D[50 / (10 + 3 (x - 1) ^2 + 5 (y + 1) ^2) +
    70 / (10 + 2 (x + 1) ^2 + 10 (y - 2) ^2), {x, -5, 5}, {y, -5, 5},
   PlotPoints → 50];
```




```
ContourPlot[50 / (10 + 3 (x - 1) ^2 + 5 (y + 1) ^2) +
   70 / (10 + 2 (x + 1) ^2 + 10 (y - 2) ^2), {x, -5, 5}, {y, -5, 5},
  PlotPoints → 50];
```



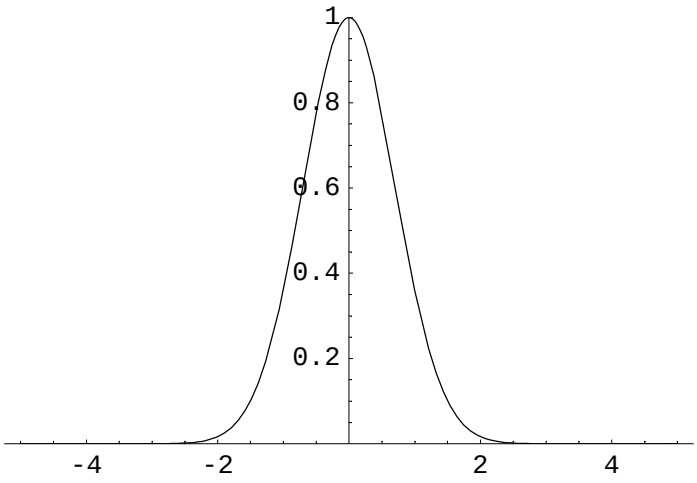
Animate! (Die Bilder werden hier nicht wiedergegeben - nur als Film sinnvoll...)

```
Table[Plot3D[(1+Sin[k Pi/20]) 50/(10+3(x-1)^2+5(y+1)^2)+ (1+Cos[k
Pi/20]) 70/(10+2(x+1)^2+10(y-2)^2),{x,-5,5},{y,-5,5},PlotPoints→
50,PlotRange->{0,20},Boxed->False,Axes->None],{k,0,40}];
```

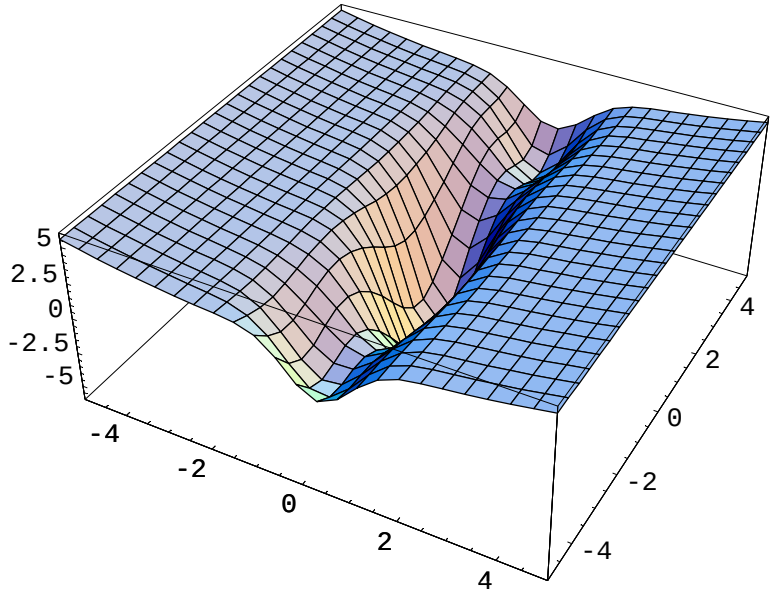
Landschaft

```
f[x_, y_] := 1 / E^x^2 Cos[x / 5] (1 - y^2 / 5)
```

```
Plot[f[x, 0], {x, -5, 5}, PlotRange → {0, 1}];
```

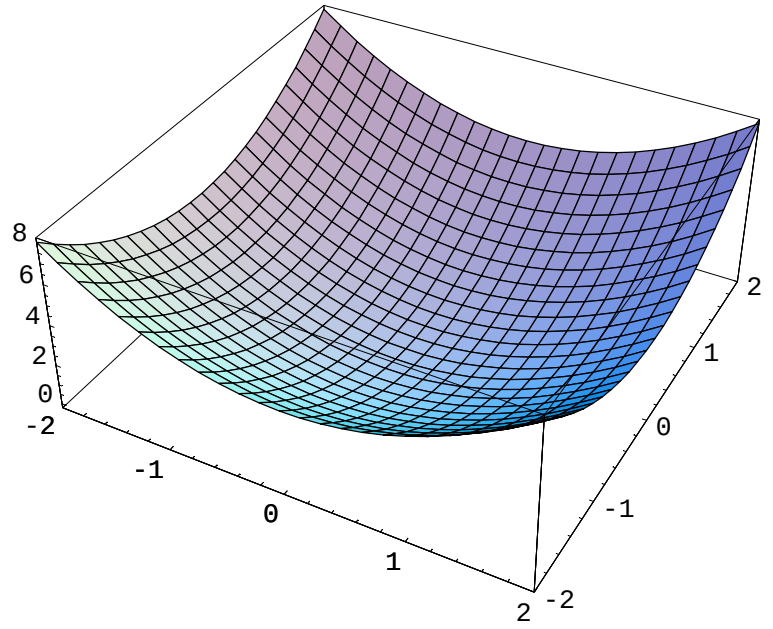


```
Remove[f];
f[x_, y_] := 1 / E^x^2 Cos[x / 5] (2 - (y - 3)^2 / 2);
g[x_, y_] := 1 - 1 / E^(x^2) Cos[x / 5];
Plot3D[-f[x, 0] (1 + Cos[x + y]) (Cos[y] + f[y / 2, 0]) + 4 g[(x - 0.3), 0] +
  (x / 4)^2, {x, -5, 5}, {y, -5, 5}, PlotRange → {6, -6}];
```

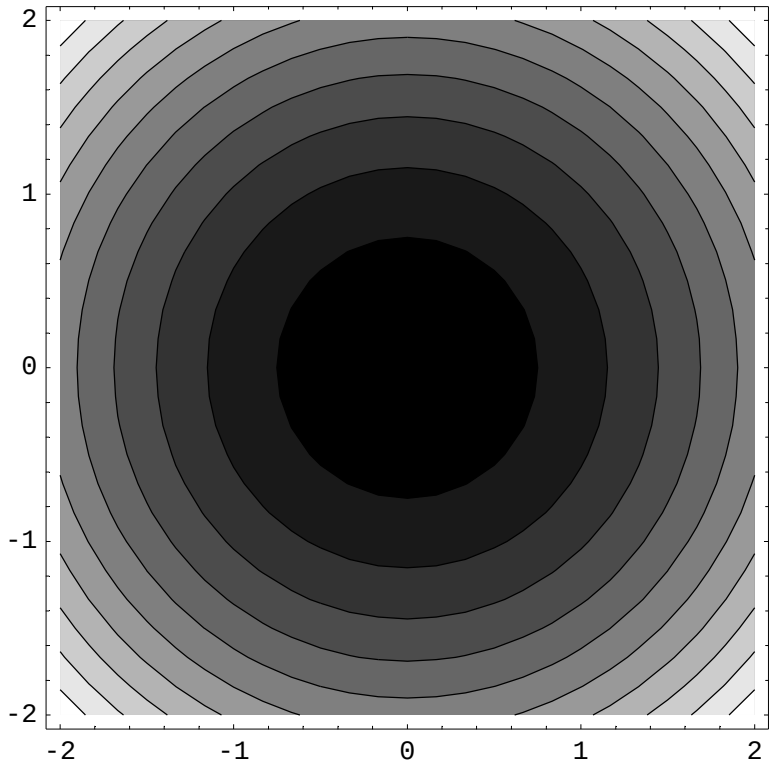


Uebungen

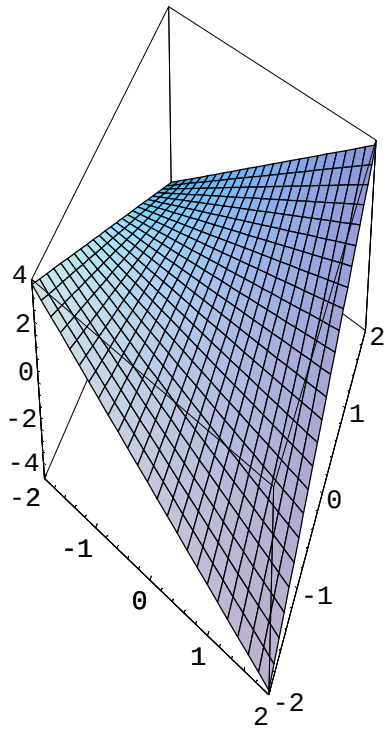
```
Plot3D[x^2 + y^2, {x, -2, 2}, {y, -2, 2}];
```



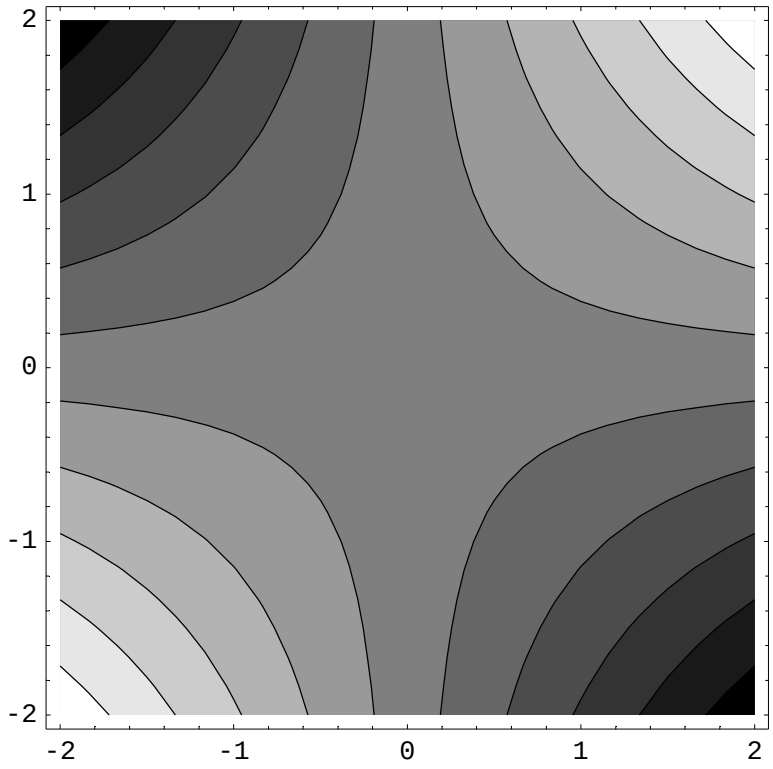
```
ContourPlot[x^2 + y^2, {x, -2, 2}, {y, -2, 2}];
```



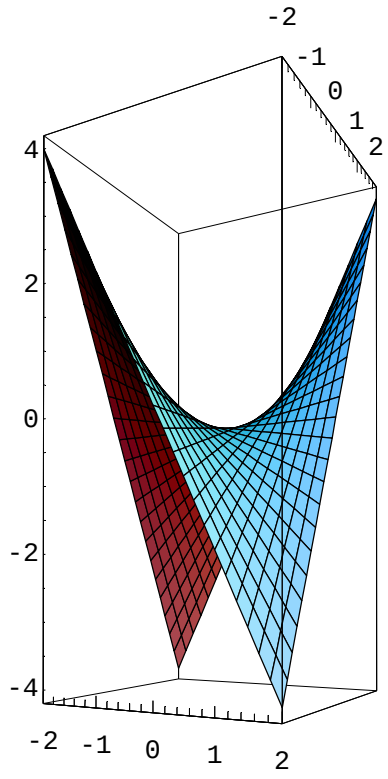

```
Plot3D[x y, {x, -2, 2}, {y, -2, 2}, AspectRatio → 2];
```



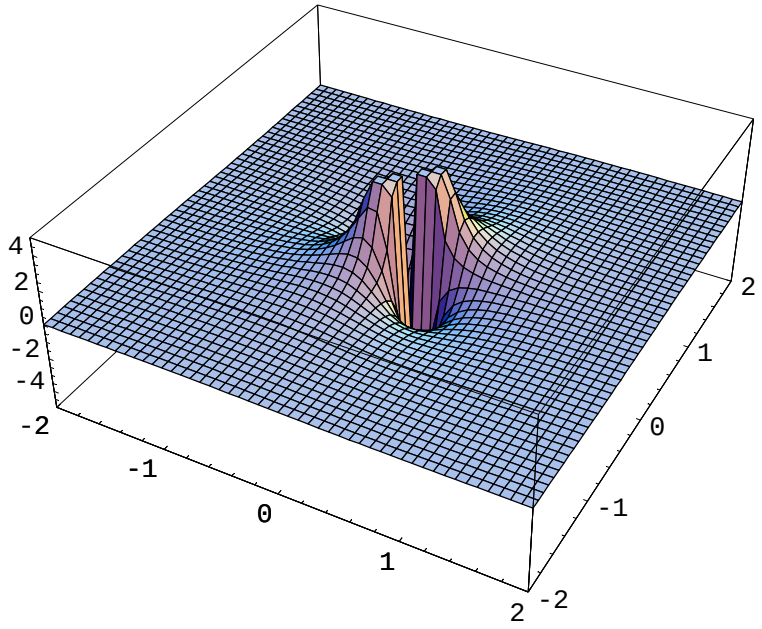
```
ContourPlot[x y, {x, -2, 2}, {y, -2, 2}];
```



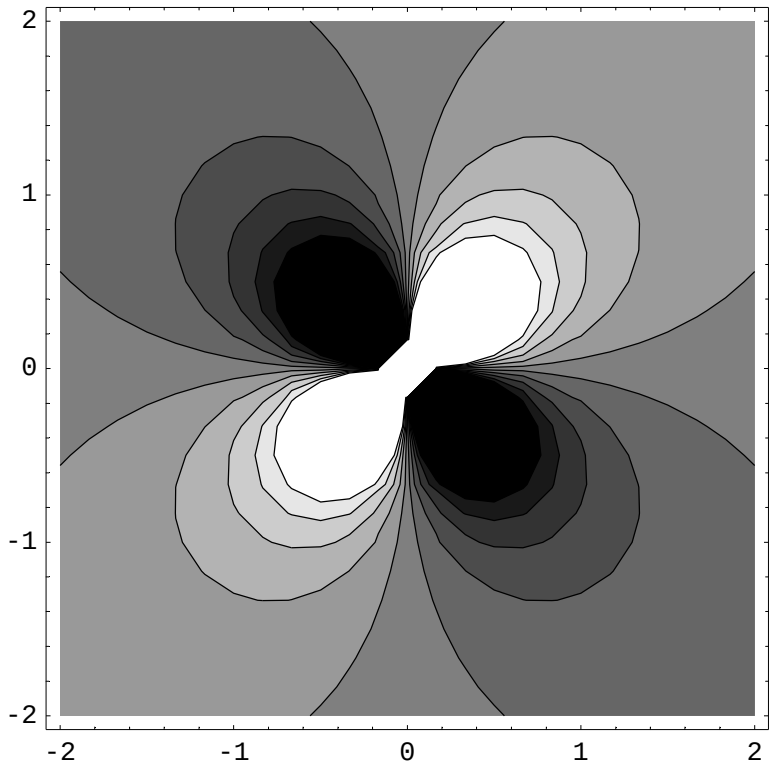

```
Plot3D[x y, {x, -2, 2}, {y, -2, 2}, AspectRatio → 2,
  ViewPoint -> {1.606, -2.976, -0.120}];
```



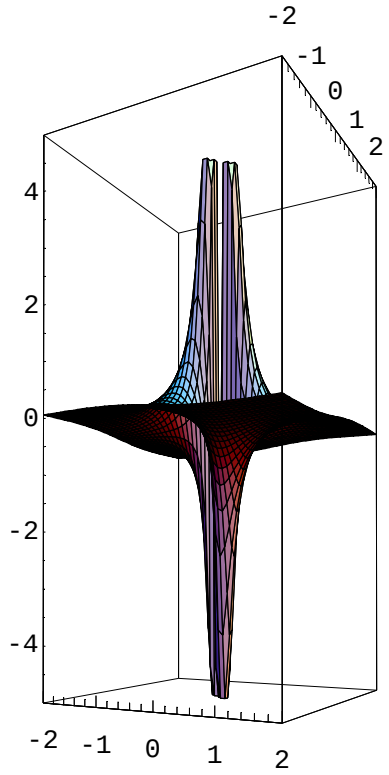
```
Plot3D[x y / (x^2 + y^2)^2, {x, -2, 2}, {y, -2, 2}, PlotPoints → 50,
  PlotRange → {-5, 5}];
```



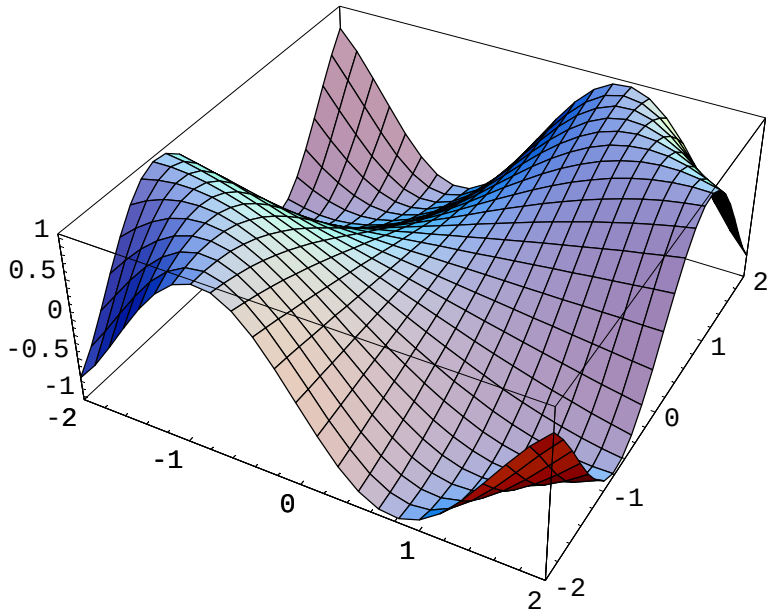

```
ContourPlot[x y / (x^2 + y^2)^2, {x, -2, 2}, {y, -2, 2}];
```



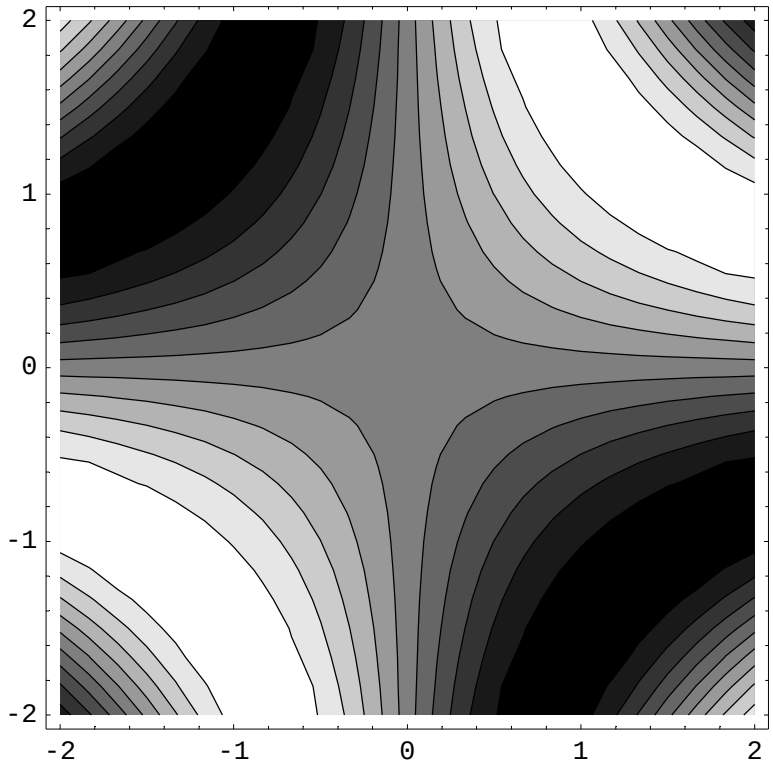
```
Plot3D[x y / (x^2 + y^2)^2, {x, -2, 2}, {y, -2, 2}, PlotPoints → 50,
  PlotRange → {-5, 5}, AspectRatio → 2,
  ViewPoint -> {1.606, -2.976, -0.120}];
```



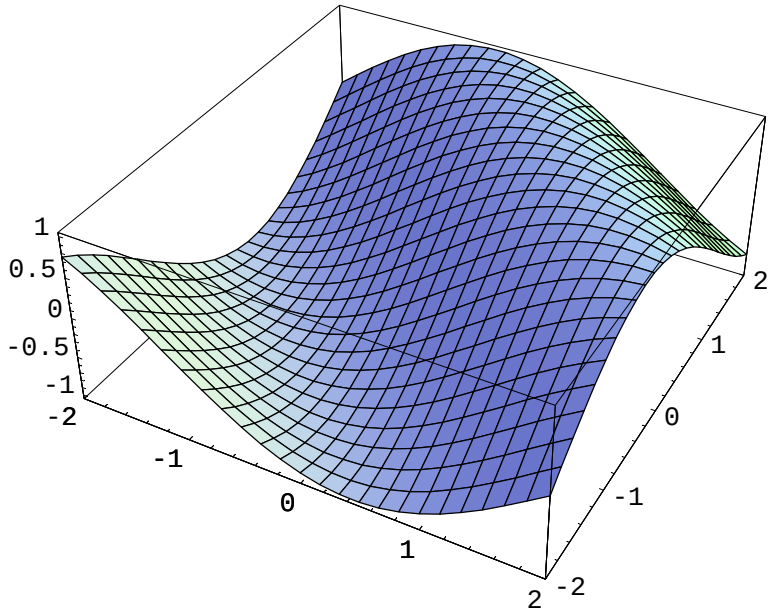

```
Plot3D[Sin[x y], {x, -2, 2}, {y, -2, 2}];
```



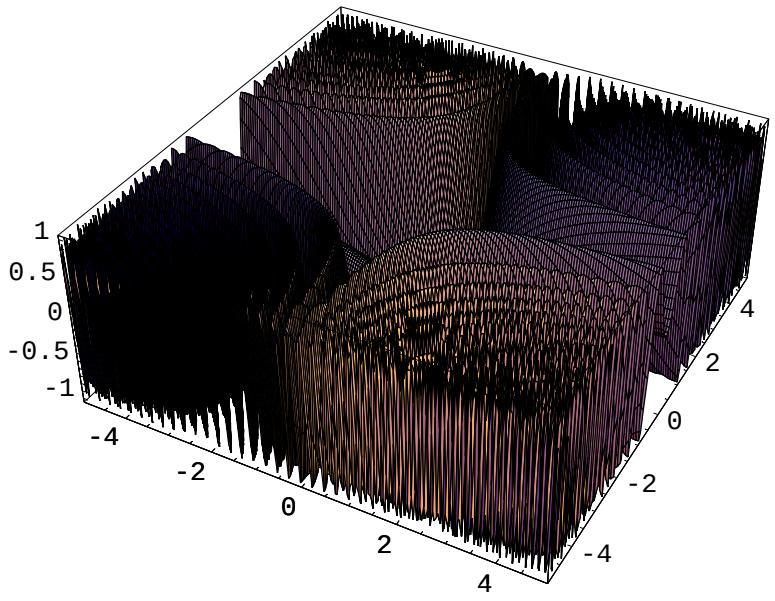
```
ContourPlot[Sin[x y], {x, -2, 2}, {y, -2, 2}];
```



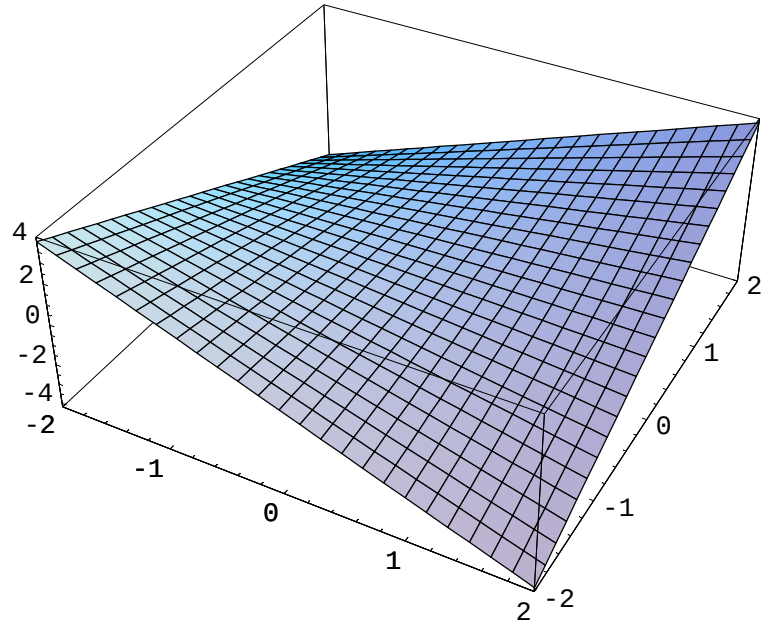

```
Plot3D[Sin[x + y], {x, -2, 2}, {y, -2, 2}];
```



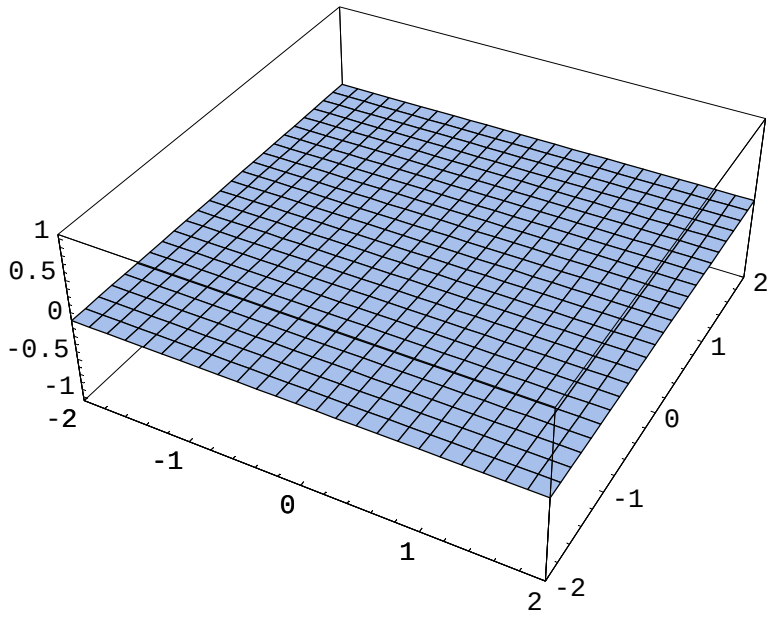
```
Plot3D[Sin[x y^2 - 1 / (x^2 + 1)], {x, -5, 5}, {y, -5, 5}, PlotPoints → 200];
```



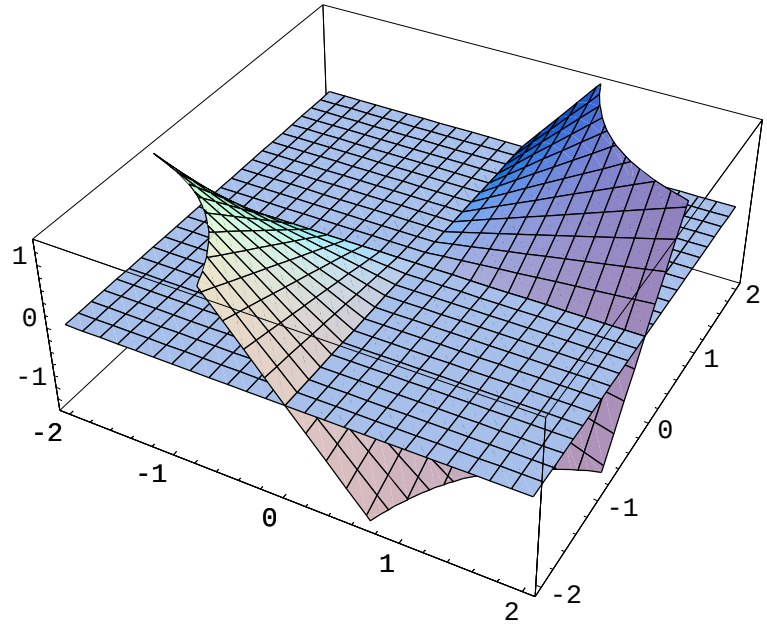

```
p2 = Plot3D[x y, {x, -2, 2}, {y, -2, 2}];
```



```
p3 = Plot3D[0, {x, -2, 2}, {y, -2, 2}];
```



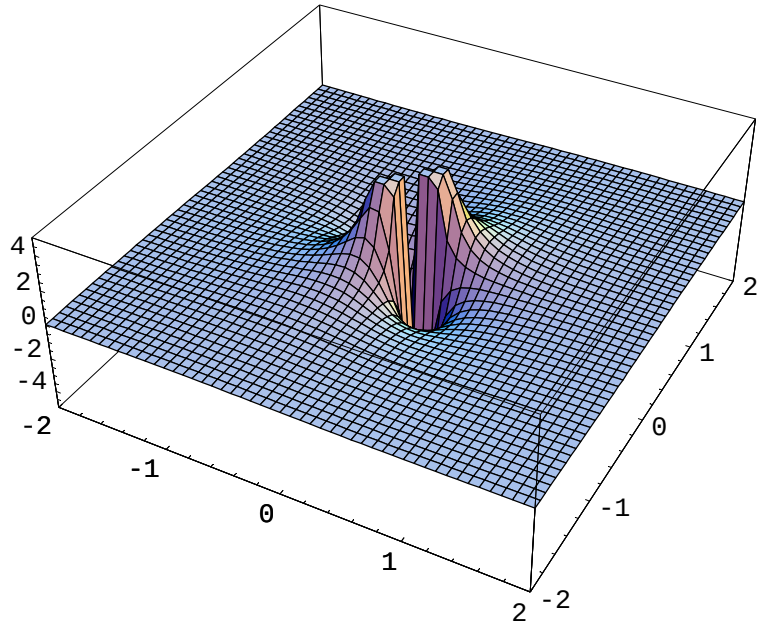

```
Show[p2, p3];
```



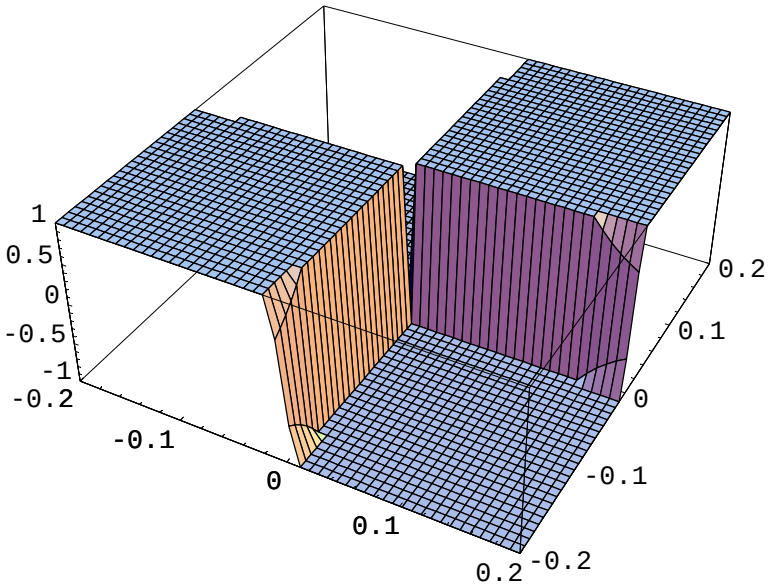

```
?PlotPoints
```

PlotPoints is an option for plotting functions that
specifies how many initial sample points to use. Mehr…

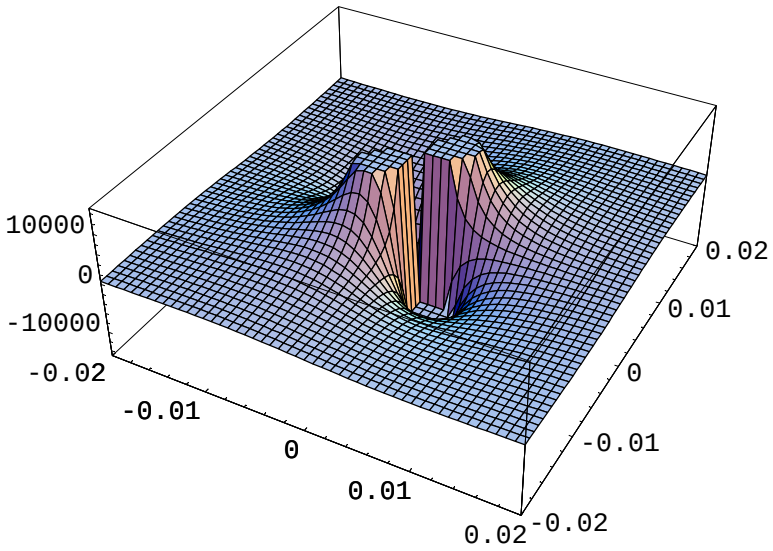
```
p3 = Plot3D[x y / (x^2 + y^2)^2, {x, -2, 2}, {y, -2, 2},
   PlotRange → {-5, 5}, PlotPoints → 50];
```



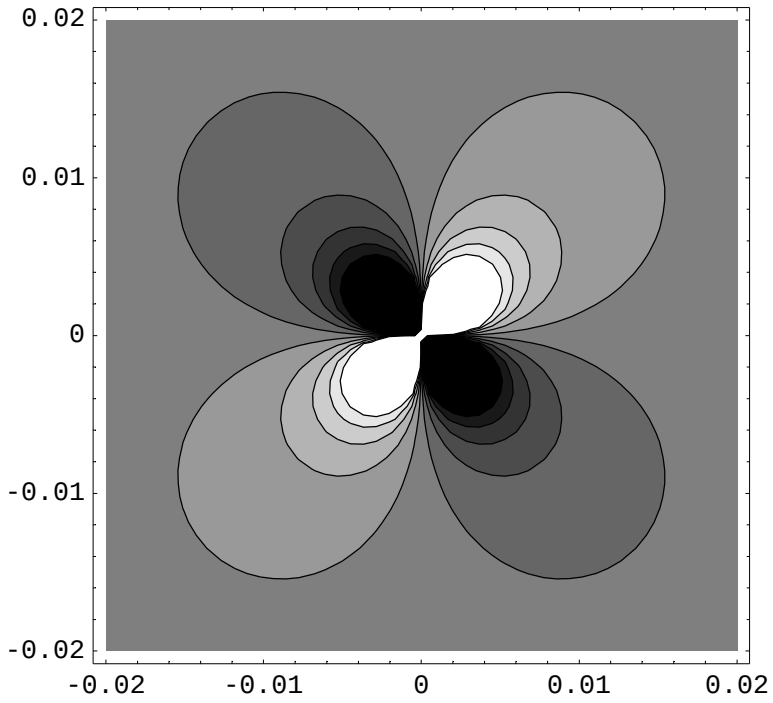

```
p3 = Plot3D[x y / (x^2 + y^2)^2, {x, -0.2, 0.2}, {y, -0.2, 0.2},
   PlotRange → {-1, 1}, PlotPoints → 50];
```



```
p3 = Plot3D[x y / (x^2 + y^2)^2, {x, -0.02, 0.02}, {y, -0.02, 0.02},
   PlotRange → {-15000, 15000}, PlotPoints → 50];
```



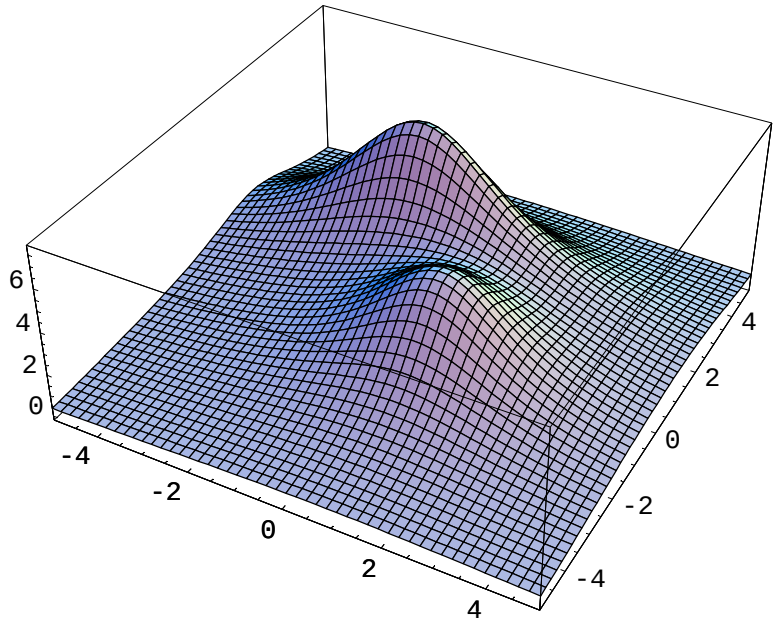

```
ContourPlot[x y / (x^2 + y^2)^2, {x, -0.02, 0.02}, {y, -0.02, 0.02},
  PlotRange → {-15000, 15000}, PlotPoints → 50];
```



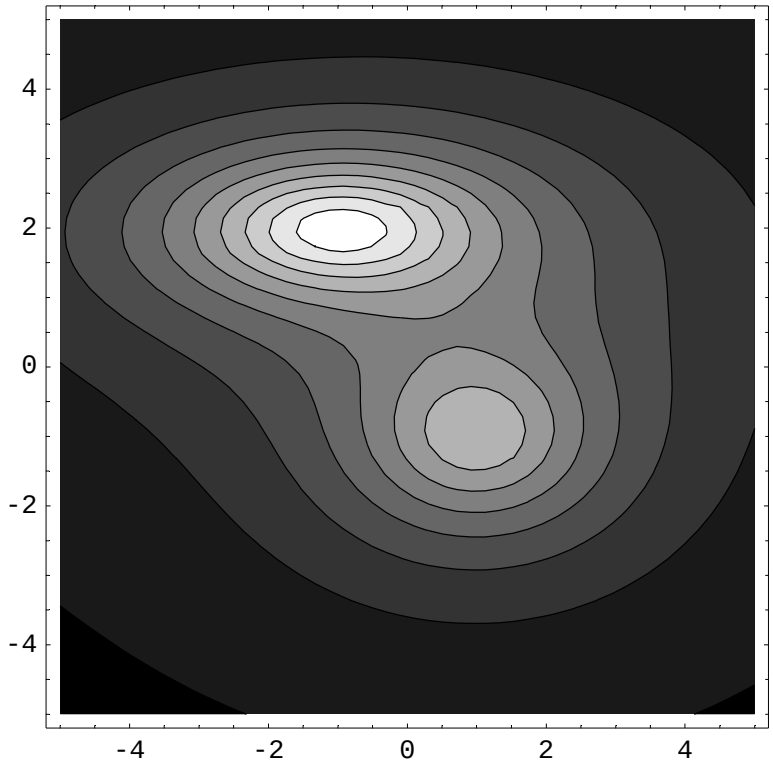
```
50 / (10 + 3 (x - 1) ^2 + 5 (y + 1) ^2) + 70 / (10 + 2 (x + 1) ^2 + 10 (y - 2) ^2)
```

$$\frac{70}{10 + 2\,(1 + x)^2 + 10\,(-2 + y)^2} + \frac{50}{10 + 3\,(-1 + x)^2 + 5\,(1 + y)^2}$$

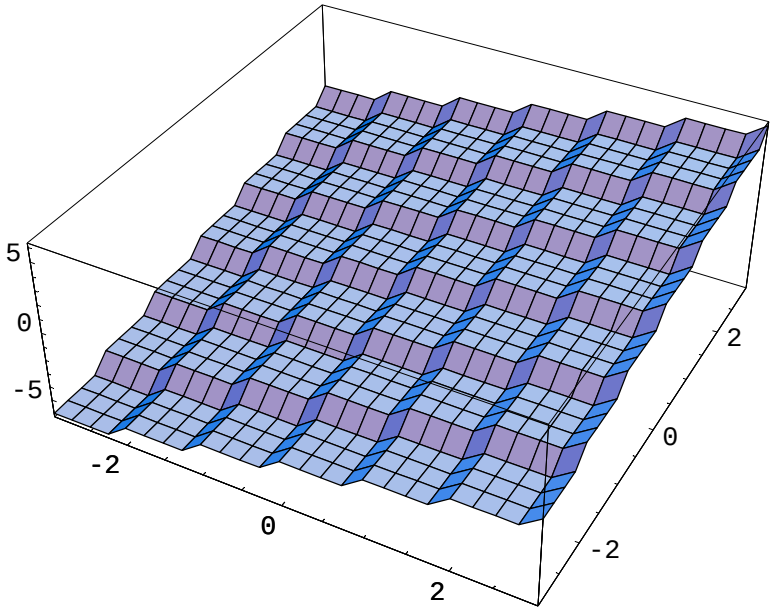
```
p3 = Plot3D[50 / (10 + 3 (x - 1) ^2 + 5 (y + 1) ^2) +
    70 / (10 + 2 (x + 1) ^2 + 10 (y - 2) ^2), {x, -5, 5}, {y, -5, 5},
   PlotPoints → 50];
```



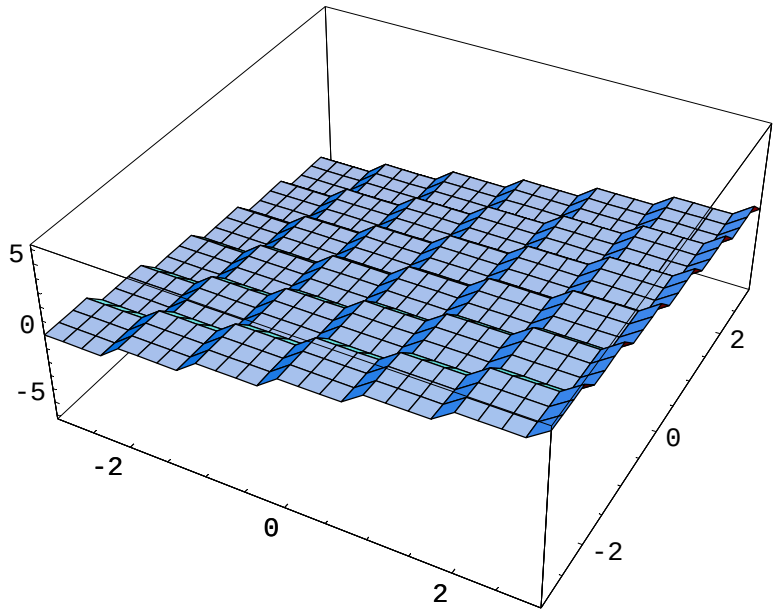
```
ContourPlot[50 / (10 + 3 (x - 1) ^2 + 5 (y + 1) ^2) +
   70 / (10 + 2 (x + 1) ^2 + 10 (y - 2) ^2), {x, -5, 5}, {y, -5, 5},
  PlotPoints → 50];
```



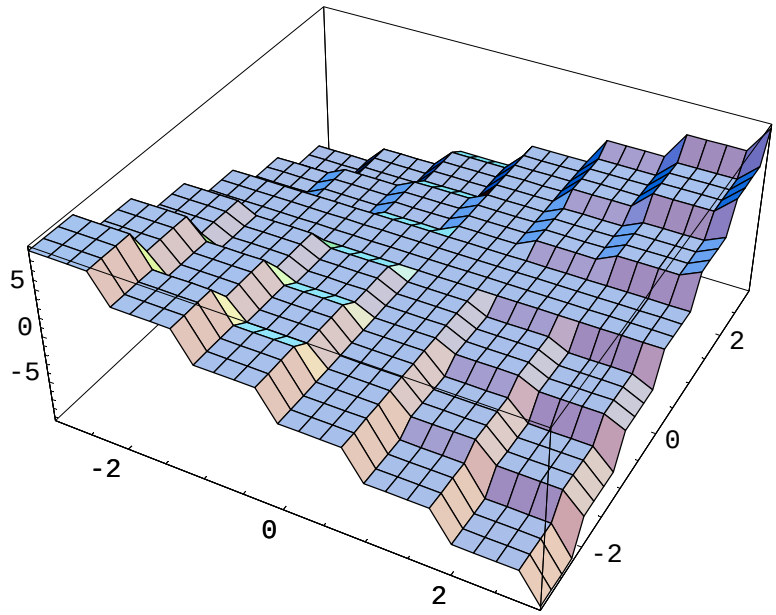

```
p4 = Plot3D[Floor[x]+Floor[y],{x,-3,3},{y,-3,3}];
```



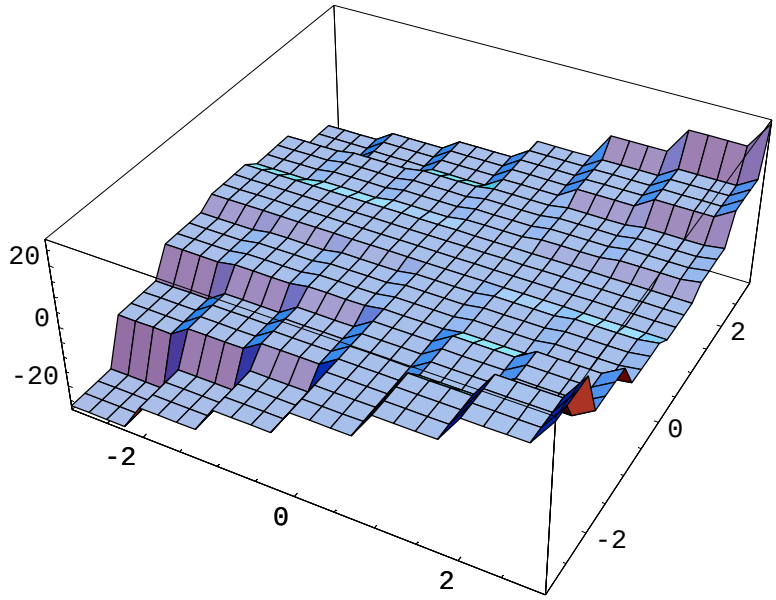
```
p5 = Plot3D[Floor[x]-Floor[y],{x,-3,3},{y,-3,3}];
```



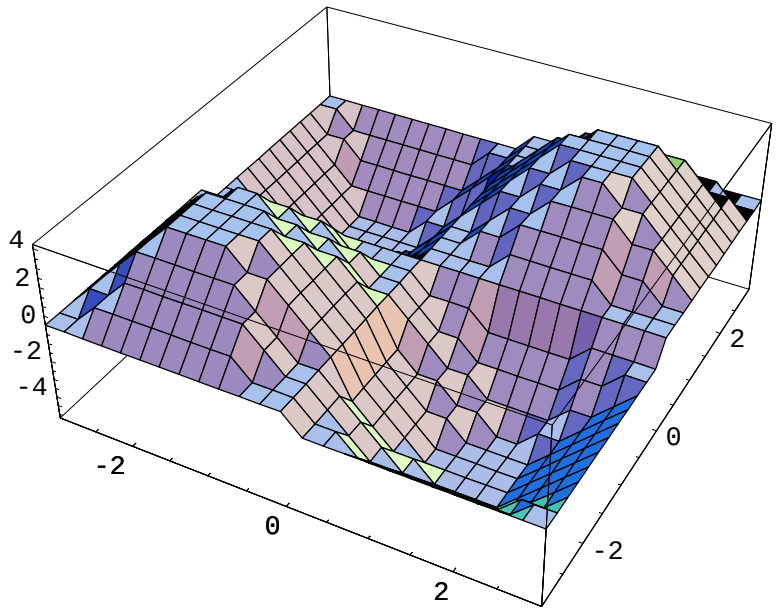

```
p6 = Plot3D[Floor[x] Floor[y],{x,-3,3},{y,-3,3}];
```



```
p7 = Plot3D[Floor[x] Floor[y]^2,{x,-3,3},{y,-3,3}];
```



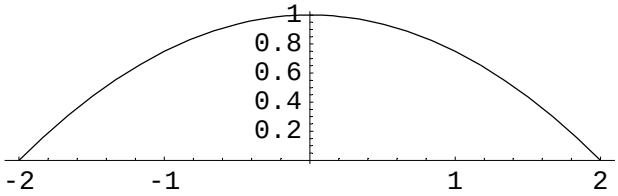

```
p8 = Plot3D[Floor[5 Sin[x] Sin[y]],{x,-3,3},{y,-3,3}];
```



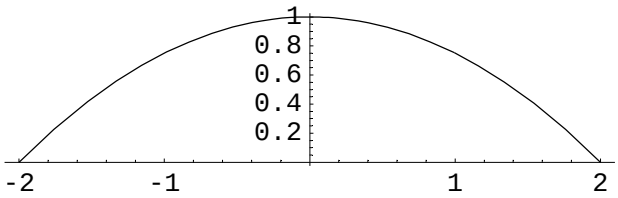
ParametricPlots

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

```
v[t_] := {t, 1 - 0.25 t^2};
ParametricPlot[v[t], {t, -2, 2}, AspectRatio → Automatic];
```



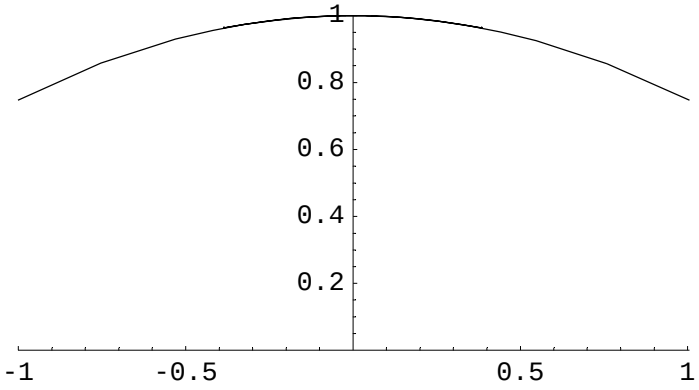

```
v[t_] := {2 Sin[t] / (1 + Cos[t]), 2 Cos[t] / (1 + Cos[t])};
ParametricPlot[v[t], {t, -Pi / 2, Pi / 2}, AspectRatio → Automatic];
```



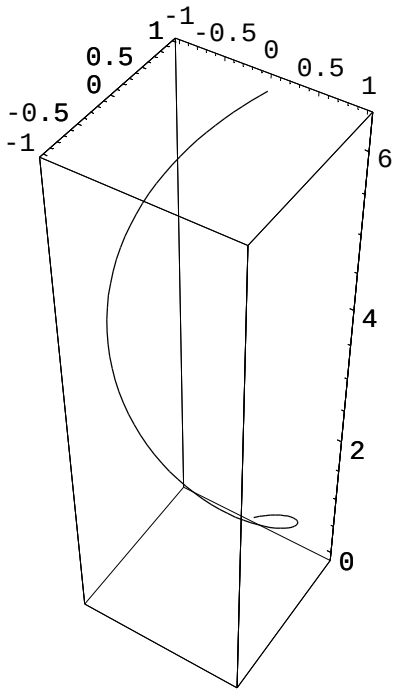

```
? PlotRange
```

PlotRange is an option for graphics functions
that specifies what points to include in a plot. Mehr…

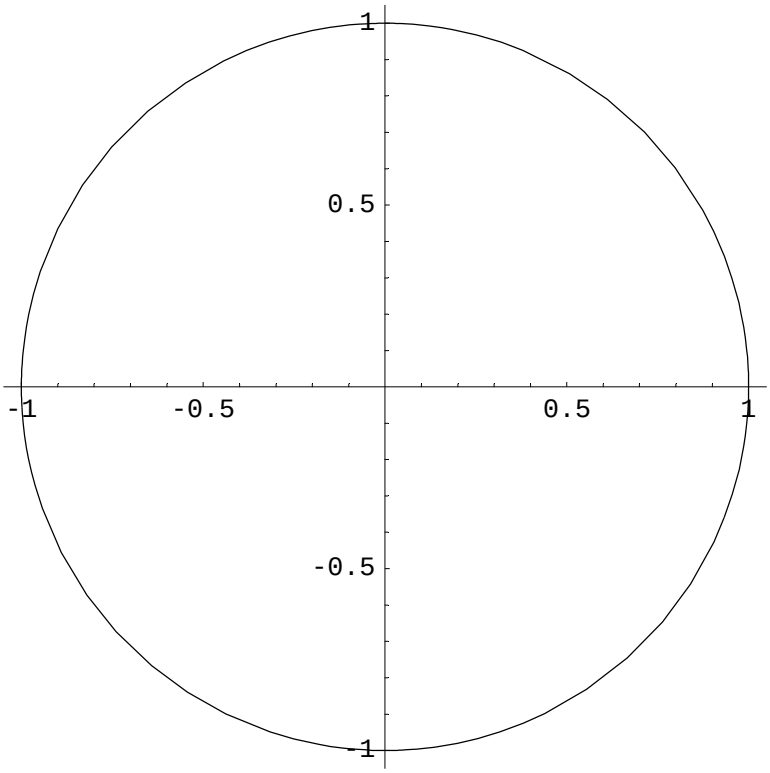
```
v[t_] := {2 t - 3 t^2 + t^3, 1 - t^2 + 3 t^3 - 3.25 t^4 + 1.5 t^5 - 0.25 t^6};
ParametricPlot[v[t], {t, -0.52138, 2.52138}, AspectRatio → Automatic,
  PlotRange → {0, 1}];
```



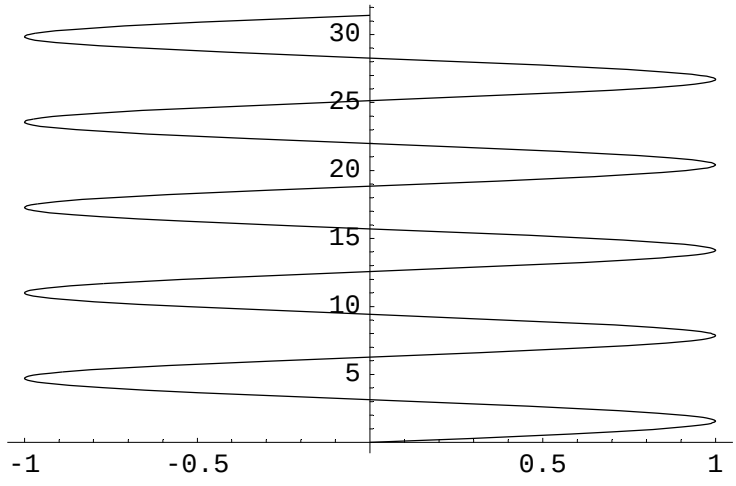
```
v[t_] := {Sin[t], Cos[t], t};
ParametricPlot3D[v[t], {t, 0, 2 Pi},
  ViewPoint -> {0.891, -1.387, 1.773}];
```



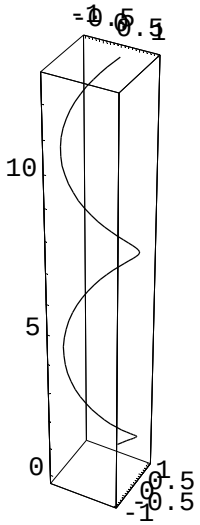
```
v[t_] := {Sin[t], Cos[t]};
ParametricPlot[v[t], {t, 0, 2 Pi}, AspectRatio → Automatic];
```



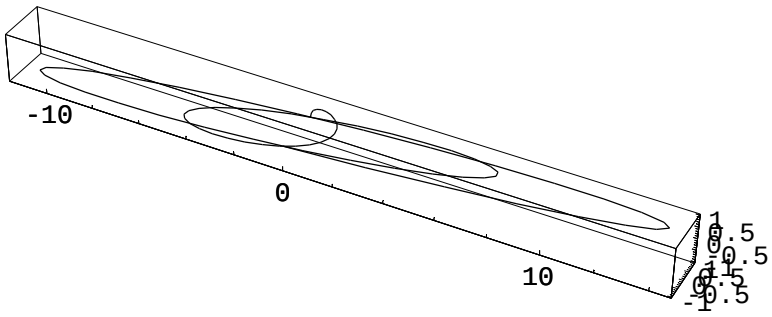

```
v[t_] := {Sin[t], t};
ParametricPlot[v[t], {t, 0, 10 Pi}];
```



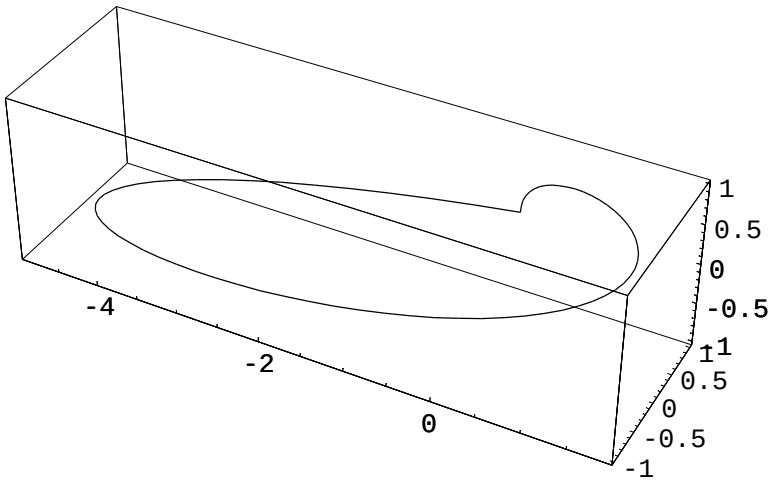
```
v[t_] := {Sin[t], Cos[t], t};
ParametricPlot3D[v[t], {t, 0, 4 Pi}, AspectRatio → Automatic];
```



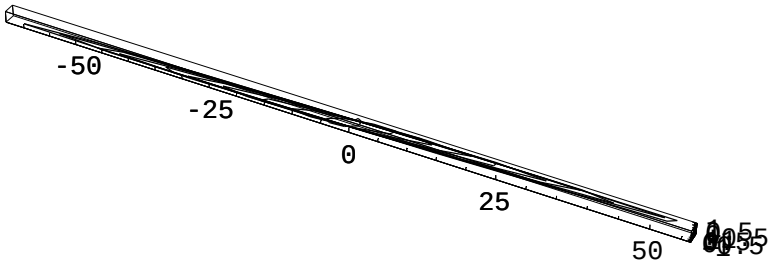

```
v[t_] := {t Sin[t], Cos[t], Sin[t]};
ParametricPlot3D[v[t], {t, 0, 5 Pi}];
```



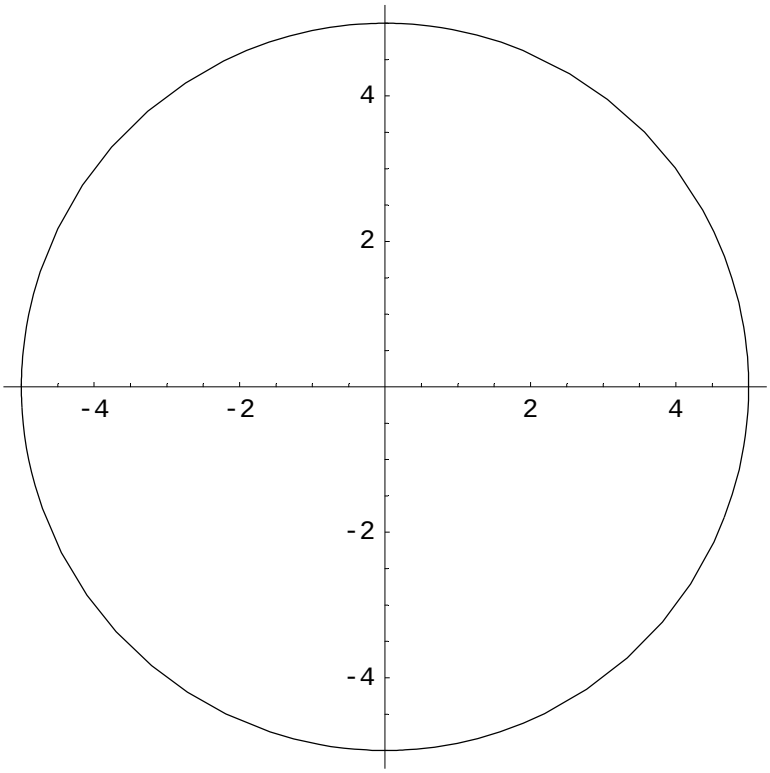
```
v[t_] := {t Sin[t], Cos[t], Sin[t]};
ParametricPlot3D[v[t], {t, 0, 2 Pi}];
```



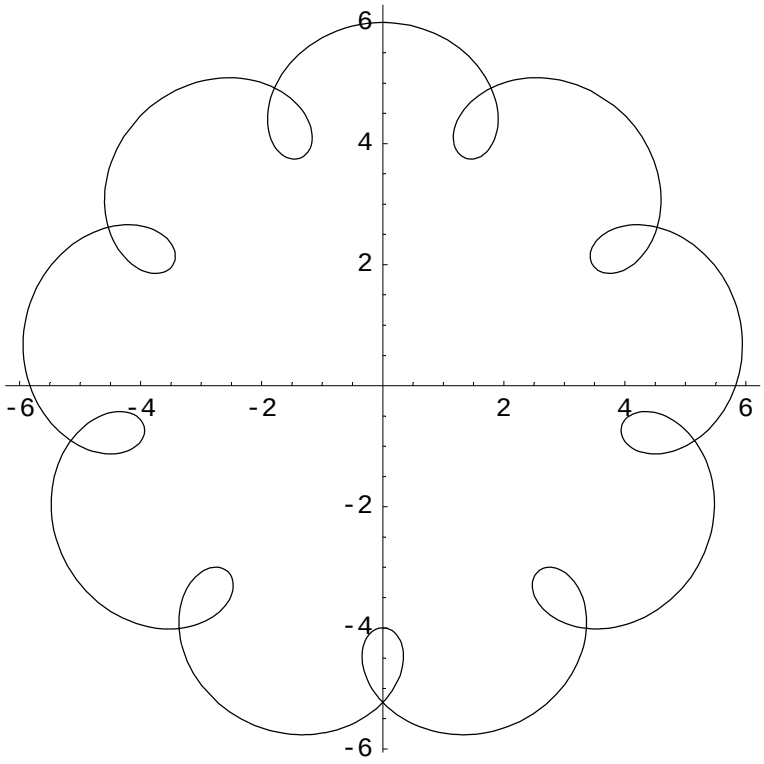

```
v[t_] := {t Sin[t], Cos[t], Sin[t]};
ParametricPlot3D[v[t], {t, 0, 20 Pi}];
```



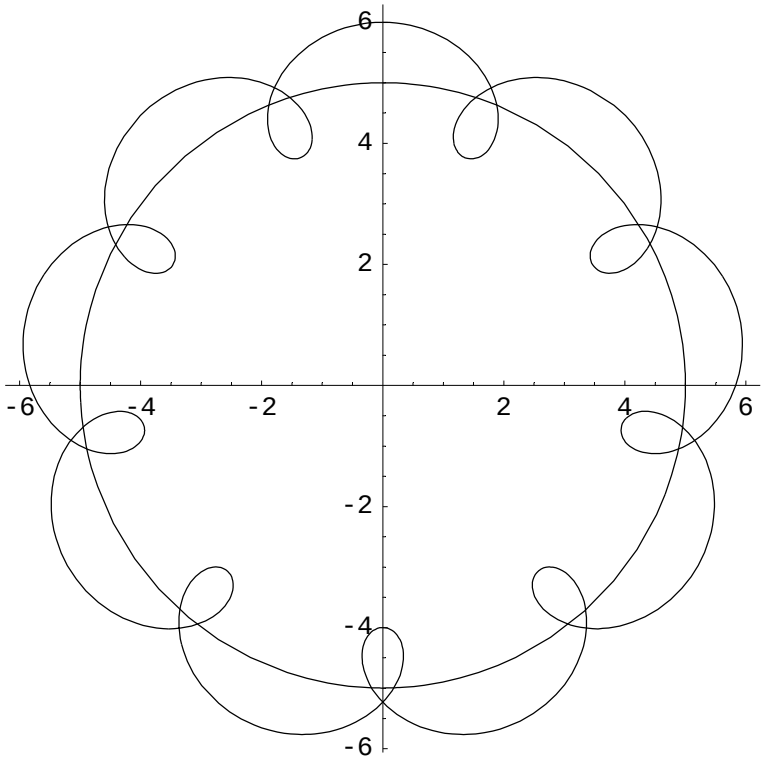
```
v[t_] := 5 {Sin[t], Cos[t]};
par1 = ParametricPlot[v[t], {t, 0, 2 Pi}, AspectRatio → Automatic];
```




```
v[t_] := 5 {Sin[t], Cos[t]} + {Sin[10 t], Cos[10 t]};
par2 = ParametricPlot[v[t], {t, 0, 2 Pi}, AspectRatio → Automatic];
```

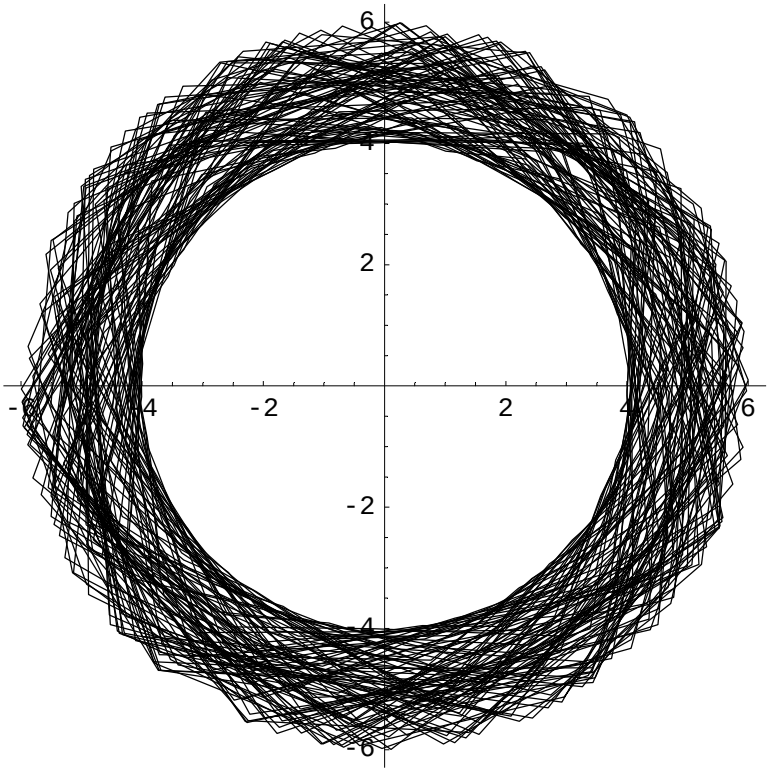


```
Show[par1, par2]
```

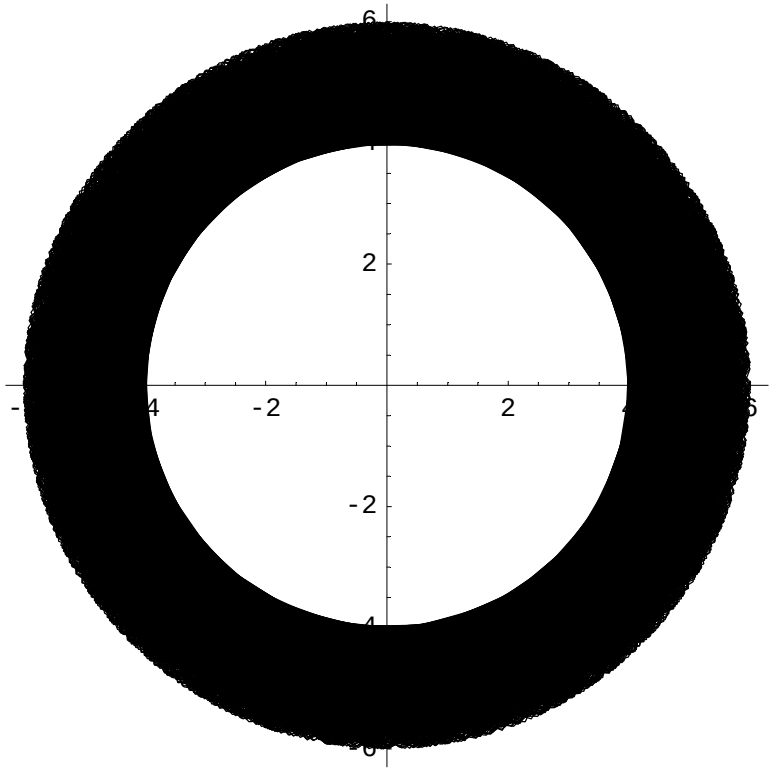



```
- Graphics -
```

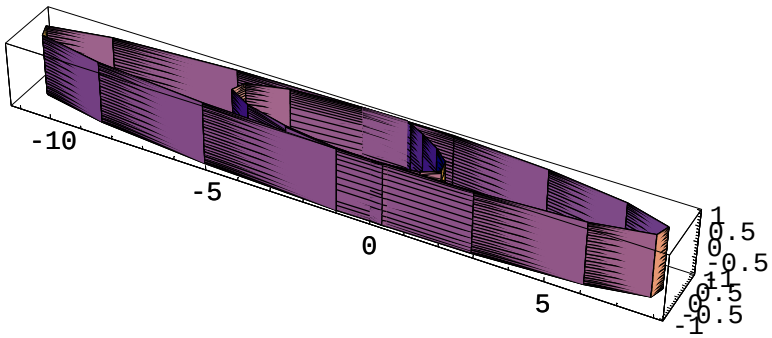
```
v[t_] := 5 {Sin[t], Cos[t]} + {Sin[E t], Cos[E t]};
par2 = ParametricPlot[v[t], {t, 0, 200 Pi}, AspectRatio → Automatic];
```



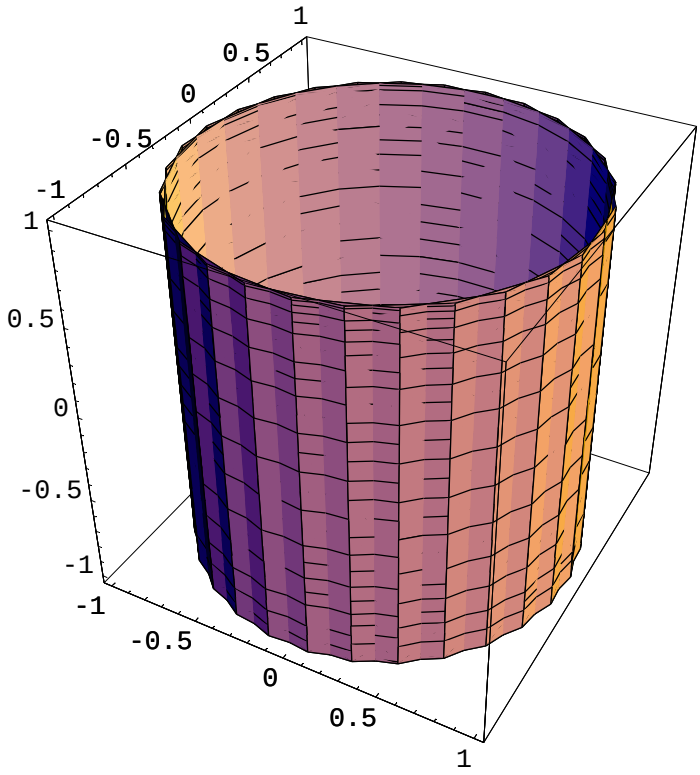
```
v[t_] := 5 {Sin[t], Cos[t]} + {Sin[E t], Cos[E t]};
par2 = ParametricPlot[v[t], {t, 0, 4000 Pi}, AspectRatio → Automatic,
   PlotPoints → 400];
```



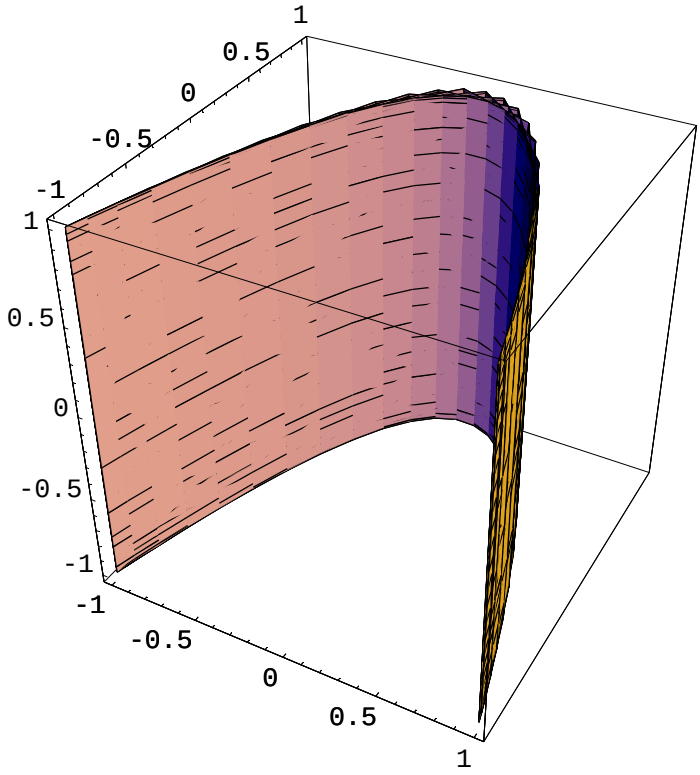

```
v[t_, u_] := {t Sin[t], Cos[t], Sin[u]};
ParametricPlot3D[v[t, u], {t, 0, 4 Pi}, {u, 0, 4 Pi}];
```



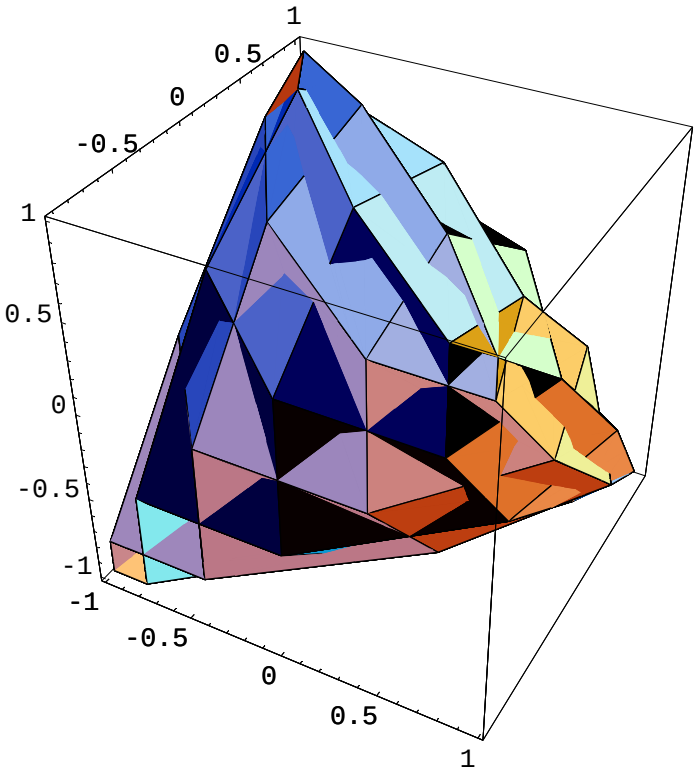
```
v[t_, u_] := {Sin[t], Cos[t], Sin[u]};
ParametricPlot3D[v[t, u], {t, 0, 4 Pi}, {u, 0, 4 Pi}];
```



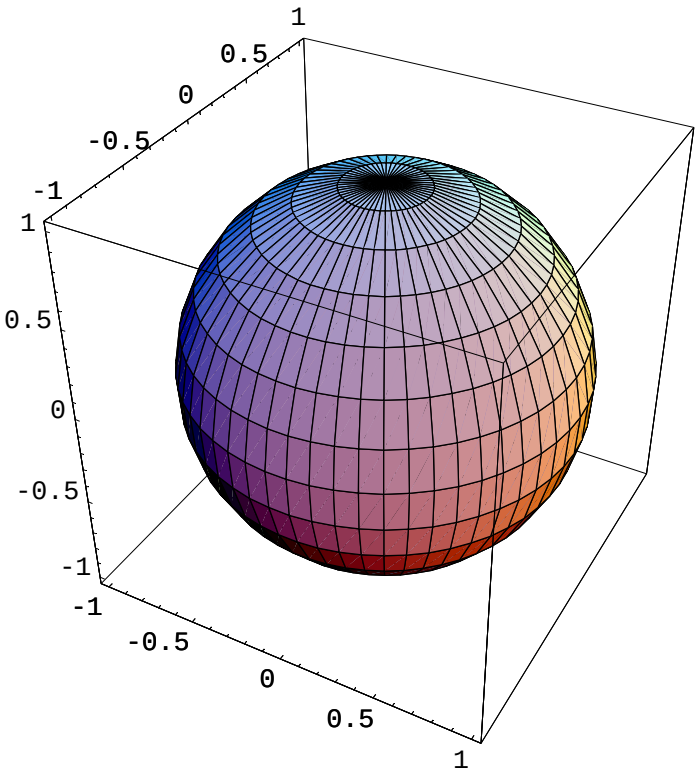

```
v[t_, u_] := {Sin[t], Cos[2 t], Sin[u]};
ParametricPlot3D[v[t, u], {t, 0, 4 Pi}, {u, 0, 4 Pi}];
```



```
v[t_,u_]:={Sin[t],Cos[u+t],Sin[u]};
ParametricPlot3D[v[t,u],{t,0,4Pi},{u,0,4Pi},PlotPoints→15];
```




```
vec[u_,v_]:={Sin[u] Cos[v],Sin[u] Sin[v],Cos[u]};
ParametricPlot3D[vec[u,v],{u,0,2Pi},{v,0,Pi}];
```



Zeit! Time! Temps!

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

```
v[t_, u_] := {Sin[t], Cos[u + t], Sin[u]};
ParametricPlot3D[v[t, u], {t, 0, 4 Pi}, {u, 0, 4 Pi}, PlotPoints → 20];
```