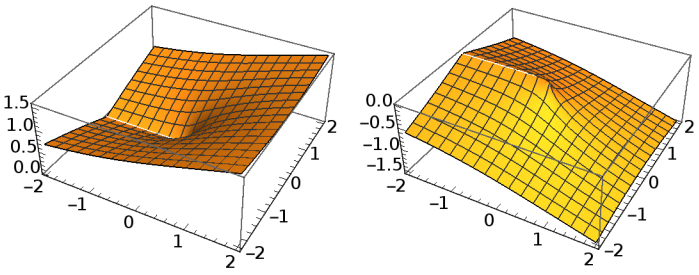
Funkce druhá odmocnina

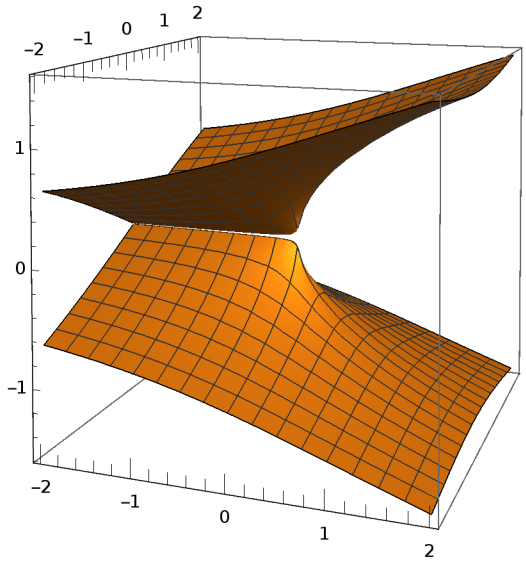
Reálná část druhé odmocniny

In[1]:=
```
gr1 = Plot3D[Re[Sqrt[Abs[x + I y]] Exp[I Arg[x + I y] / 2]], {x, -2, 2}, {y, -2, 2}];
gr2 = Plot3D[Re[Sqrt[Abs[x + I y]] Exp[I (Arg[x + I y] / 2 + π)]], {x, -2, 2}, {y, -2, 2}];
Show[GraphicsGrid[{{gr1, gr2}}]]
Show[gr1, gr2, PlotRange → All, AspectRatio → 1]
```

Out[3]=



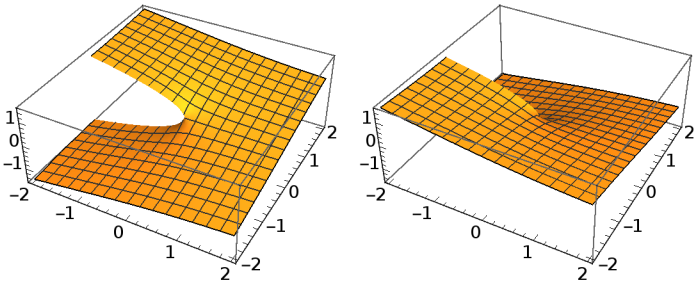
Out[4]=



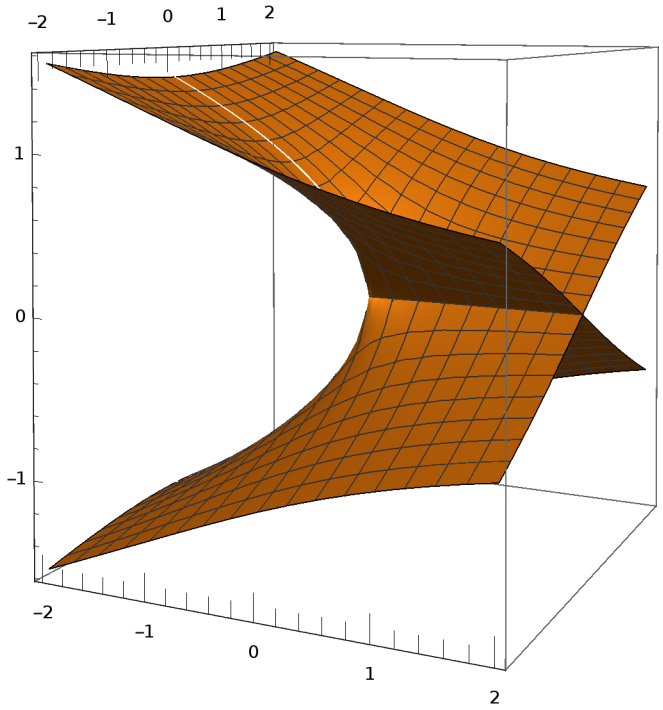
Imaginární část druhé odmocniny

In[5]:=
```
gr1 = Plot3D[Im[Sqrt[Abs[x + I y]] Exp[I Arg[x + I y] / 2]], {x, -2, 2}, {y, -2, 2}];
gr2 = Plot3D[Im[Sqrt[Abs[x + I y]] Exp[I (Arg[x + I y] / 2 + π)]], {x, -2, 2}, {y, -2, 2}];
Show[GraphicsGrid[{{gr1, gr2}}]]
Show[gr1, gr2, PlotRange → All, AspectRatio → 1]
```

Out[7]=



Out[8]=

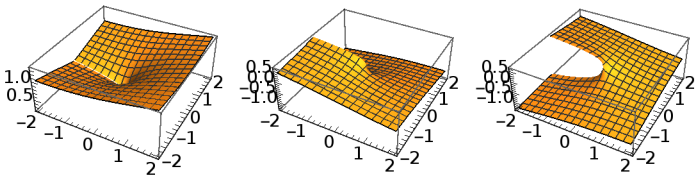


Funkce třetí odmocnina

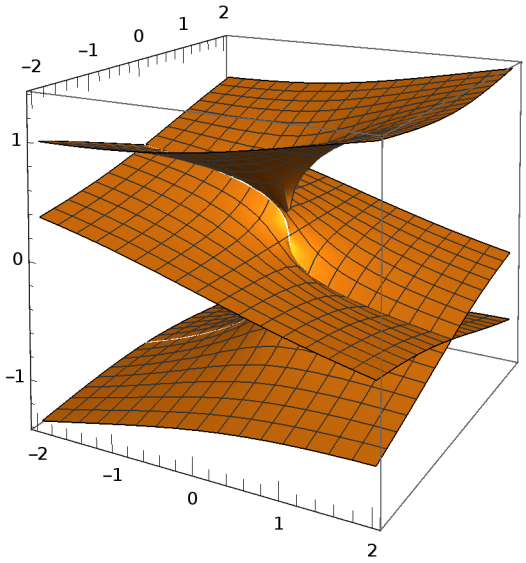
Reálná část třetí odmocniny

In[9]:=
```
gr1 = Plot3D[Re[(Abs[x + I y])^(1 / 3) Exp[I (Arg[x + I y] / 3)]], {x, -2, 2}, {y, -2, 2}];
gr2 =
  Plot3D[Re[(Abs[x + I y])^(1 / 3) Exp[I (Arg[x + I y] / 3 + 2 π / 3)]], {x, -2, 2}, {y, -2, 2}];
gr3 = Plot3D[Re[(Abs[x + I y])^(1 / 3) Exp[I (Arg[x + I y] / 3 + 4 π / 3)]],
   {x, -2, 2}, {y, -2, 2}];
Show[GraphicsGrid[{{gr1, gr2, gr3}}]]
Show[gr1, gr2, gr3, PlotRange → All, AspectRatio → 1]
```

Out[12]=



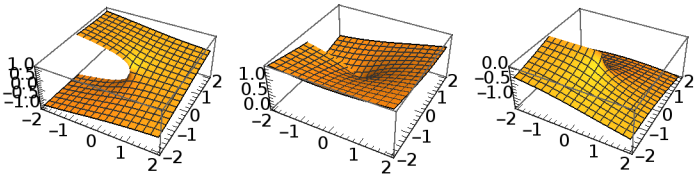
Out[13]=



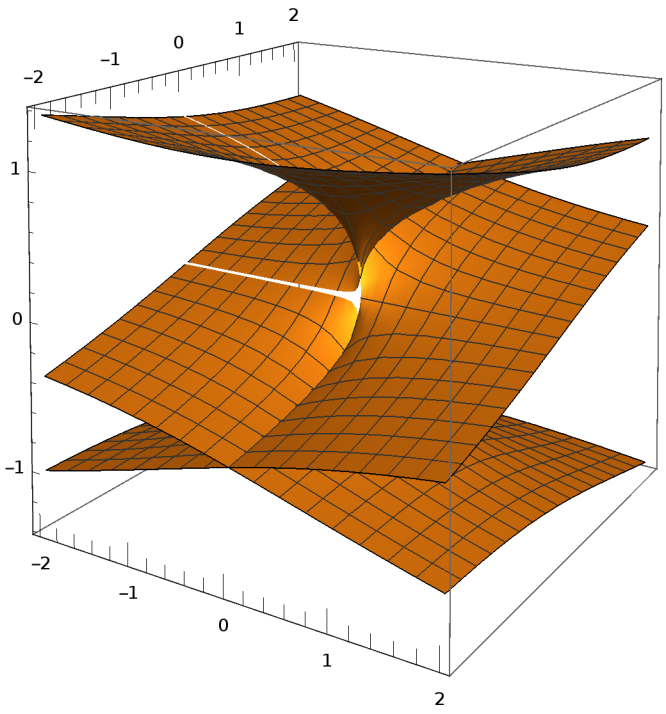
Imaginární částtřetí odmocniny

In[14]:=
```
gr1 = Plot3D[Im[(Abs[x + I y]) ^ (1 / 3) Exp[I (Arg[x + I y] / 3)]], {x, -2, 2}, {y, -2, 2}];
gr2 =
  Plot3D[Im[(Abs[x + I y]) ^ (1 / 3) Exp[I (Arg[x + I y] / 3 + 2 π / 3)]], {x, -2, 2}, {y, -2, 2}];
gr3 = Plot3D[Im[(Abs[x + I y]) ^ (1 / 3) Exp[I (Arg[x + I y] / 3 + 4 π / 3)]],
   {x, -2, 2}, {y, -2, 2}];
Show[GraphicsGrid[{{gr1, gr2, gr3}}]]
Show[gr1, gr2, gr3, PlotRange → All, AspectRatio → 1]
```

Out[17]=



Out[18]=

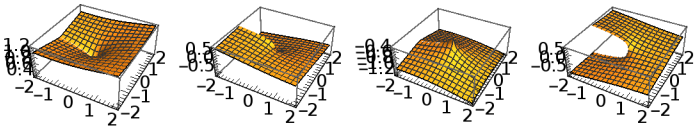


Funkce čtvrtáodmocnina

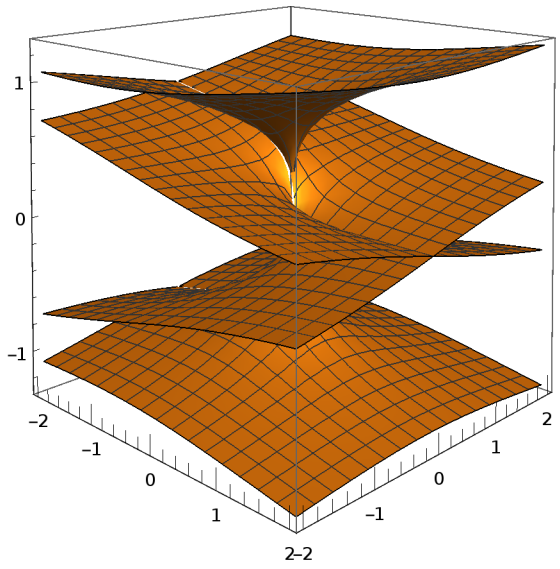
Reálná část črtvrtéodmocniny

In[19]:=
```
gr1 = Plot3D[Re[(Abs[x + I y]) ^ (1 / 4) Exp[I (Arg[x + I y] / 4)]], {x, -2, 2}, {y, -2, 2}];
gr2 =
  Plot3D[Re[(Abs[x + I y]) ^ (1 / 4) Exp[I (Arg[x + I y] / 4 + 2 π / 4)]], {x, -2, 2}, {y, -2, 2}];
gr3 = Plot3D[Re[(Abs[x + I y]) ^ (1 / 4) Exp[I (Arg[x + I y] / 4 + 4 π / 4)]],
   {x, -2, 2}, {y, -2, 2}];
gr4 = Plot3D[Re[(Abs[x + I y]) ^ (1 / 4) Exp[I (Arg[x + I y] / 4 + 6 π / 4)]],
   {x, -2, 2}, {y, -2, 2}];
Show[GraphicsGrid[{{gr1, gr2, gr3, gr4}}]]
Show[gr1, gr2, gr3, gr4, PlotRange → All, AspectRatio → 1]
```

Out[23]=



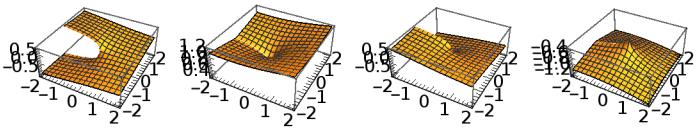
Out[24]=



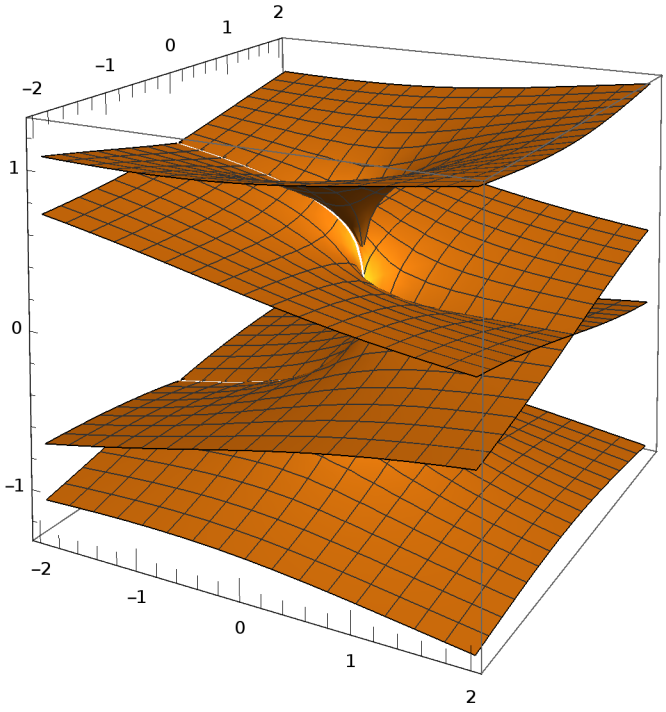
Imaginární část čtvrtéodmocniny

In[25]:=
```
gr1 = Plot3D[Im[(Abs[x + I y]) ^ (1 / 4) Exp[I (Arg[x + I y] / 4)]], {x, -2, 2}, {y, -2, 2}];
gr2 =
  Plot3D[Im[(Abs[x + I y]) ^ (1 / 4) Exp[I (Arg[x + I y] / 4 + 2 π / 4)]], {x, -2, 2}, {y, -2, 2}];
gr3 = Plot3D[Im[(Abs[x + I y]) ^ (1 / 4) Exp[I (Arg[x + I y] / 4 + 4 π / 4)]],
   {x, -2, 2}, {y, -2, 2}];
gr4 = Plot3D[Im[(Abs[x + I y]) ^ (1 / 4) Exp[I (Arg[x + I y] / 4 + 6 π / 4)]],
   {x, -2, 2}, {y, -2, 2}];
Show[GraphicsGrid[{{gr1, gr2, gr3, gr4}}]]
Show[gr1, gr2, gr3, gr4, PlotRange → All, AspectRatio → 1]
```

Out[29]=



Out[30]=



Elementární funkce a Riemannovy plochy

```
Directory[]
SetDirectory["/home/pnecesal/SKOLA_VYUKA/2017_ZKA"]
<< RiemannSurfacePlot3D`
```

```
/home/pnecesal
```

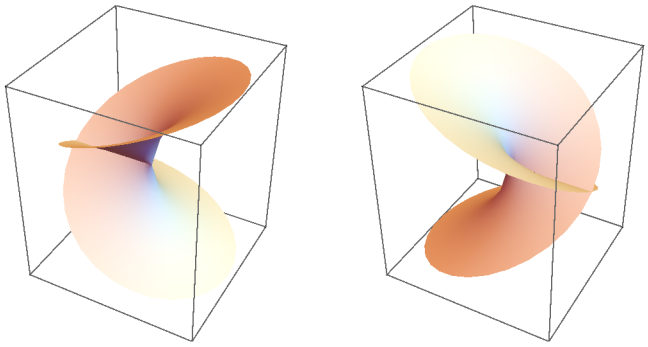
```
/home/pnecesal/SKOLA_VYUKA/2017_ZKA
```

```
? RiemannSurfacePlot3D
```

RiemannSurfacePlot3D[w == f[z], reim[w[z]], {z, w}] plots a Riemann surface of w as
the real or imaginary part reim of w over the complex z–plane.
RiemannSurfacePlot3D[w == f[z], {ζ1, ζ2, ζ3}, {z, w}] plots a Riemann surface of w as {ζ1, ζ2, ζ3}
along the Cartesian coordinate axes where ζ1,
ζ2, ζ3 can be Re[z], Im[z], Re[w], Im[w] or a linear combination of them.

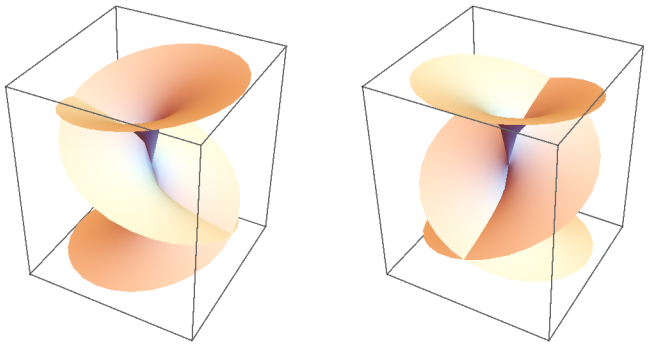
Funkce druhá odmocnina

```
f5[z_] = z^(1 / 2);
Show[GraphicsGrid[{{RiemannSurfacePlot3D[w == f5[z], Re[w], {z, w}],
    RiemannSurfacePlot3D[w == f5[z], Im[w], {z, w}]}}]]
```

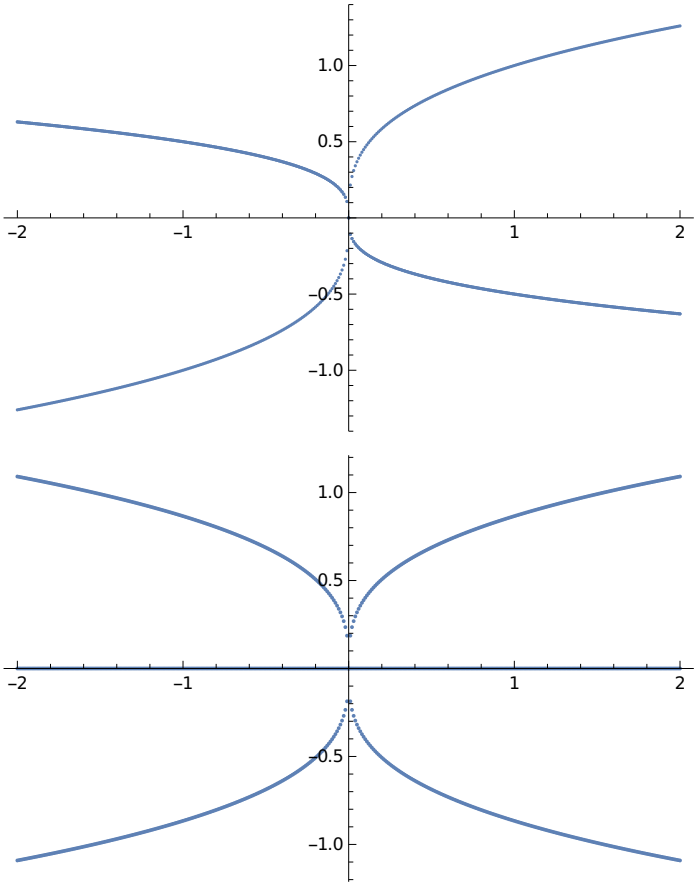


Funkce třetí odmocnina

```
f5[z_] = z^(1 / 3);
Show[GraphicsGrid[{{RiemannSurfacePlot3D[w == f5[z], Re[w], {z, w}],
    RiemannSurfacePlot3D[w == f5[z], Im[w], {z, w}]}}]]
```



```
w = Range[-2, 2, 0.01];
res = Map[z /. Solve[z^3 == #1, z] &, w];
Rdata = Flatten[Table[Map[{w[[k]], #1} &, Re[res[[k]]]], {k, 1, Length[w]}], 1];
Idata = Flatten[Table[Map[{w[[k]], #1} &, Im[res[[k]]]], {k, 1, Length[w]}], 1];
ListPlot[Rdata]
ListPlot[Idata]
```



Logaritmická funkce

```
Clear[z, w]
f6[z_] = Log[z];
Show[GraphicsGrid[{{RiemannSurfacePlot3D[w == f6[z], Re[w], {z, w}],
    RiemannSurfacePlot3D[w == f6[z], Im[w], {z, w}]}}]]
```