

```

In[1]:= SetOptions[Plot3D(*Or whichever plot you desire*),
        ColorFunction -> "Rainbow"(*One of many options*);
SetOptions[ContourPlot(*Or whichever plot you desire*),
        ColorFunction -> "Rainbow"(*One of many options*);
SetOptions[RegionPlot(*Or whichever plot you desire*),
        ColorFunction -> "BlueGreenYellow"(*One of many options*);

```

```

In[201]:= (*a*)
f = (x + 2 y) / (2 x + y)
a = {x, -6, 6}
b = {y, -6, 6}
FunctionDomain[f, {x, y}]
Plot3D[f, a, b]
ContourPlot[f, a, b]

```

```

Out[201]= 
$$\frac{x + 2 y}{2 x + y}$$


```

```

Out[202]= {x, -6, 6}

```

```

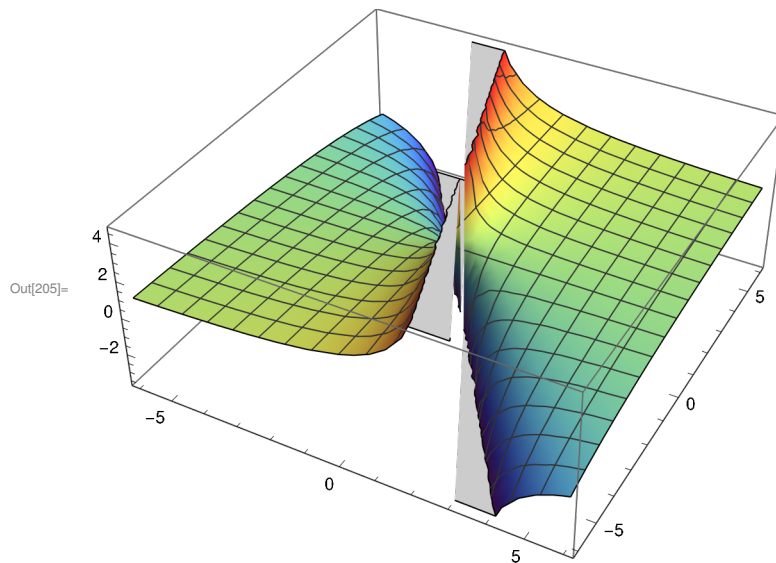
Out[203]= {y, -6, 6}

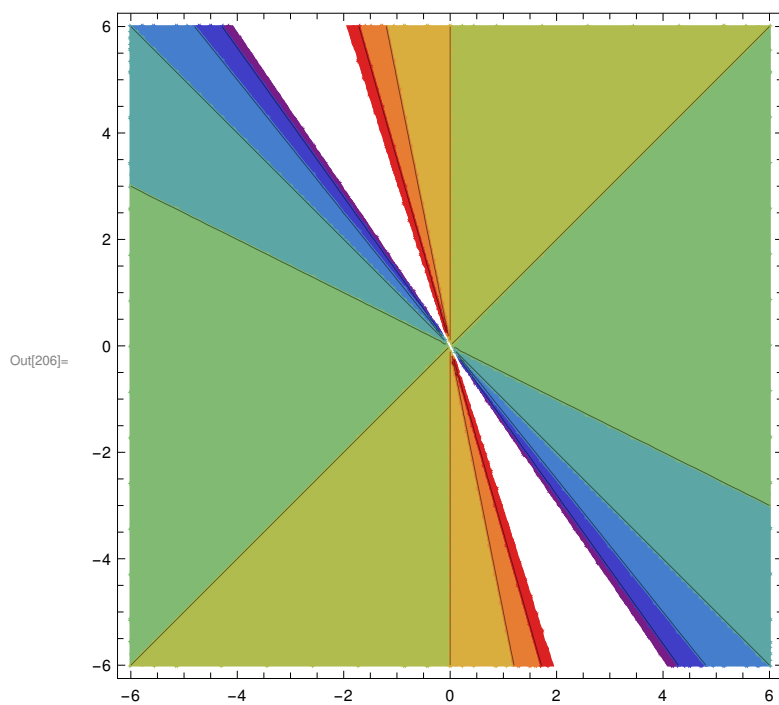
```

```

Out[204]=  $2 x + y \neq 0$ 

```





```
In[207]:= (*b*)
f = (x * y + 2 x + y + 2) / (x * y ^ 2 + y ^ 2 + x + 1)
a = {x, -6, 6}
b = {y, -6, 6}
FunctionDomain[f, {x, y}]
Plot3D[f, a, b]
ContourPlot[f, a, b]
```

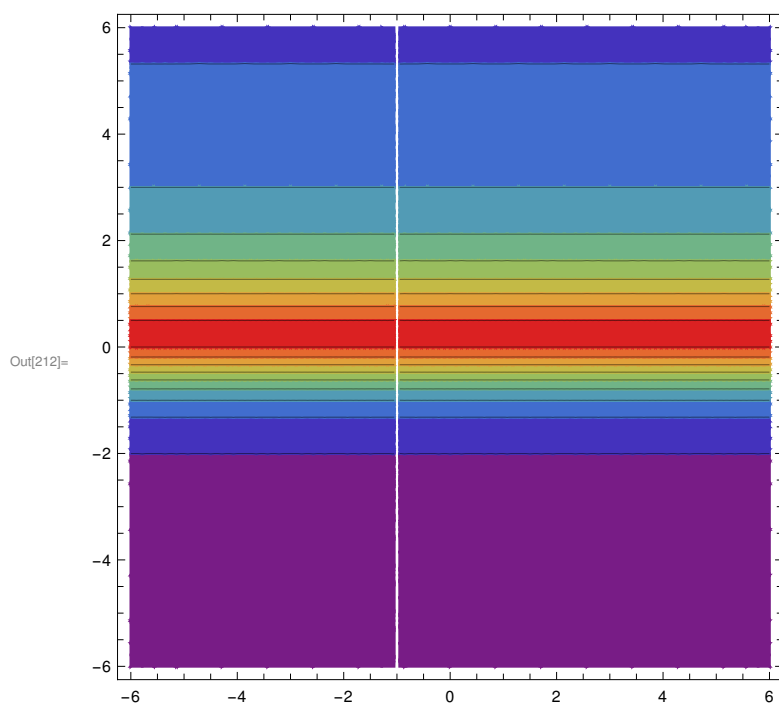
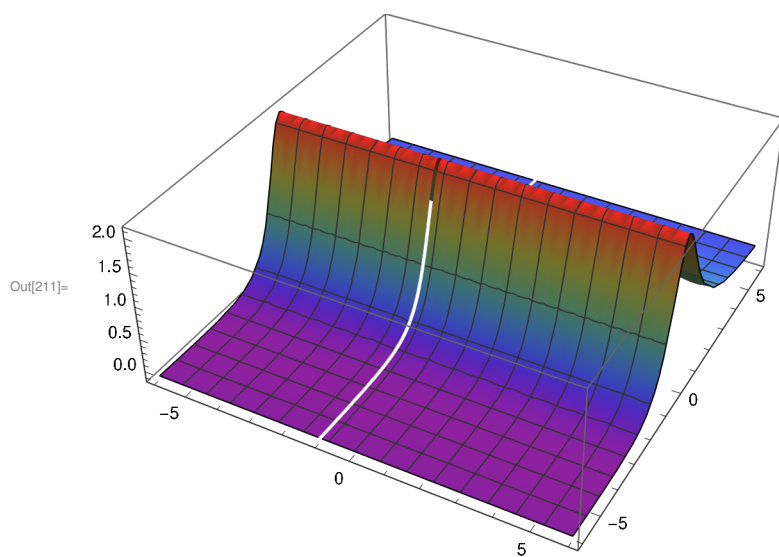
Out[207]=

$$\frac{2 + 2x + y + xy}{1 + x + y^2 + xy^2}$$

Out[208]= {x, -6, 6}

Out[209]= {y, -6, 6}

Out[210]= $x \neq -1$



```
In[213]:= (*C*)
f = (x ^ 2 * y ^ 2 - 4) / (x ^ 4 + y ^ 4 - 17)
a = {x, -6, 6}
b = {y, -6, 6}
FunctionDomain[f, {x, y}]
Plot3D[f, a, b]
ContourPlot[f, a, b]
```

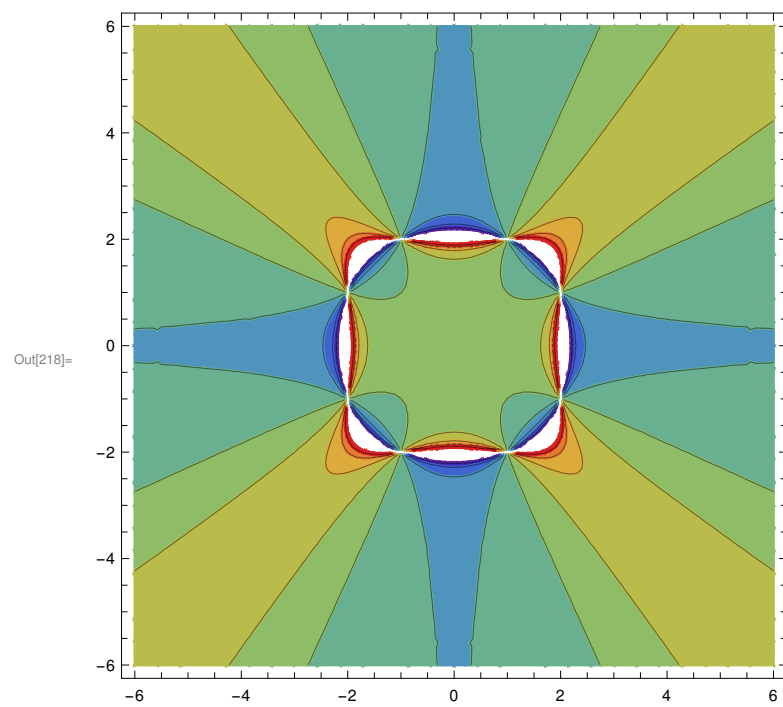
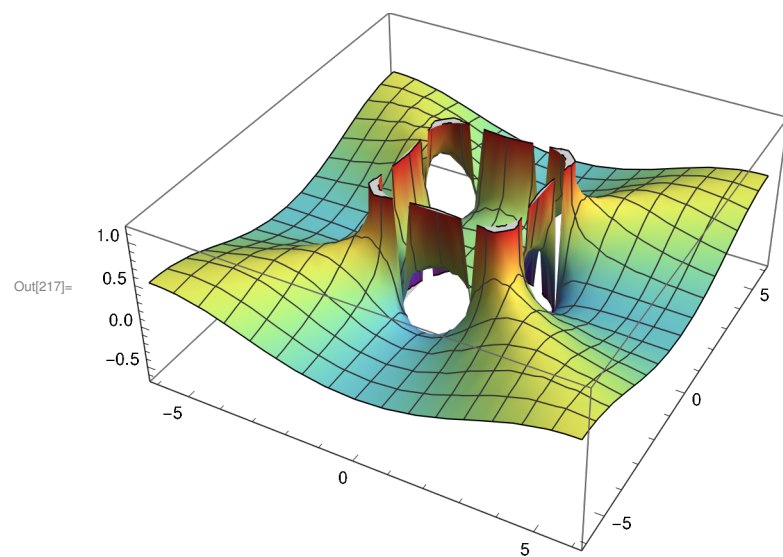
Out[213]=

$$\frac{-4 + x^2 y^2}{-17 + x^4 + y^4}$$

Out[214]= {x, -6, 6}

Out[215]= {y, -6, 6}

Out[216]= $x^4 + y^4 \neq 17$



(*d*)

$f = (\text{Tan}[x * y]) / (y)$

$a = \{x, -6, 6\}$

$b = \{y, -6, 6\}$

`FunctionDomain[f, {x, y}]`

`Plot3D[f, a, b]`

`ContourPlot[f, a, b]`

$\text{Tan}[x y]$

Out[219]=

y

Out[220]=

$\{x, -6, 6\}$

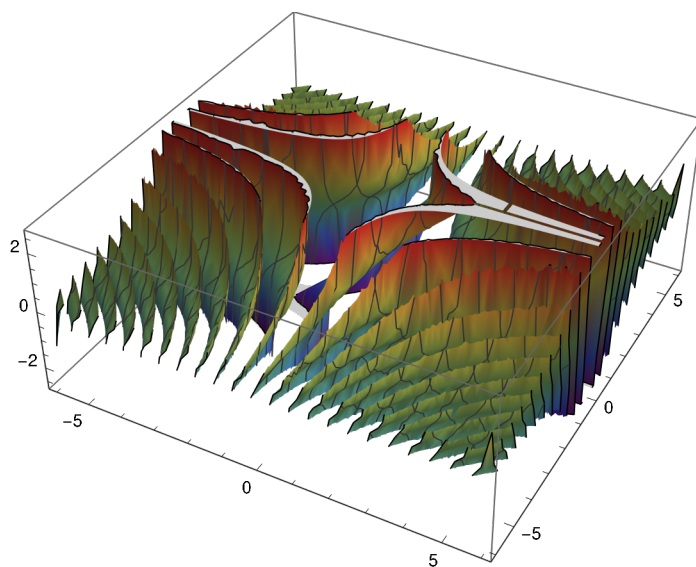
Out[221]=

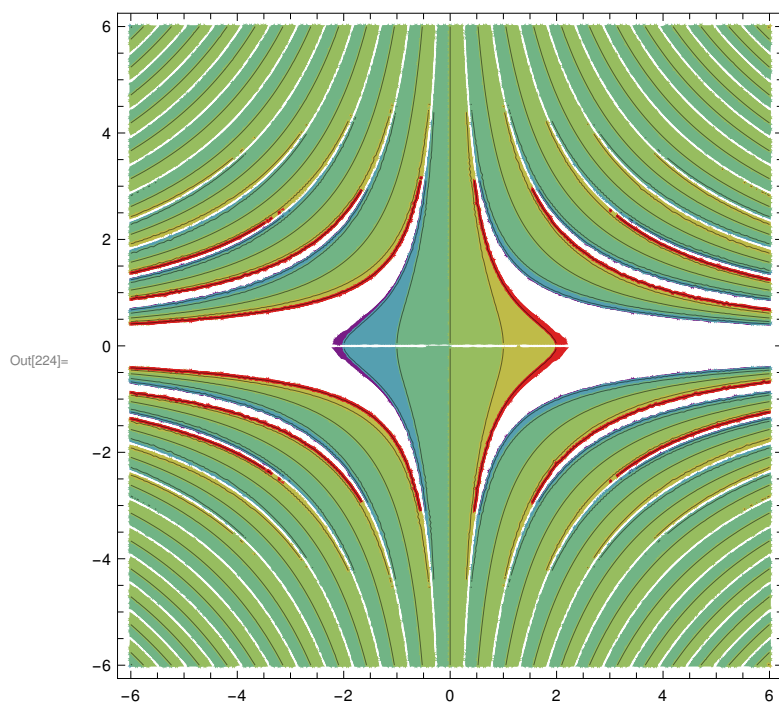
$\{y, -6, 6\}$

Out[222]=

$\frac{1}{2} + \frac{x y}{\pi} \notin \mathbb{Z} \ \&\& \ y \neq 0$

Out[223]=





In[297]:= **(***)**

In[231]:= **(***)**

f = (x ^ 4 + y ^ 4) / (x ^ 2 + y ^ 2)

a = {x, -6, 6}

b = {y, -6, 6}

FunctionDomain[f, {x, y}]

Plot3D[f, a, b]

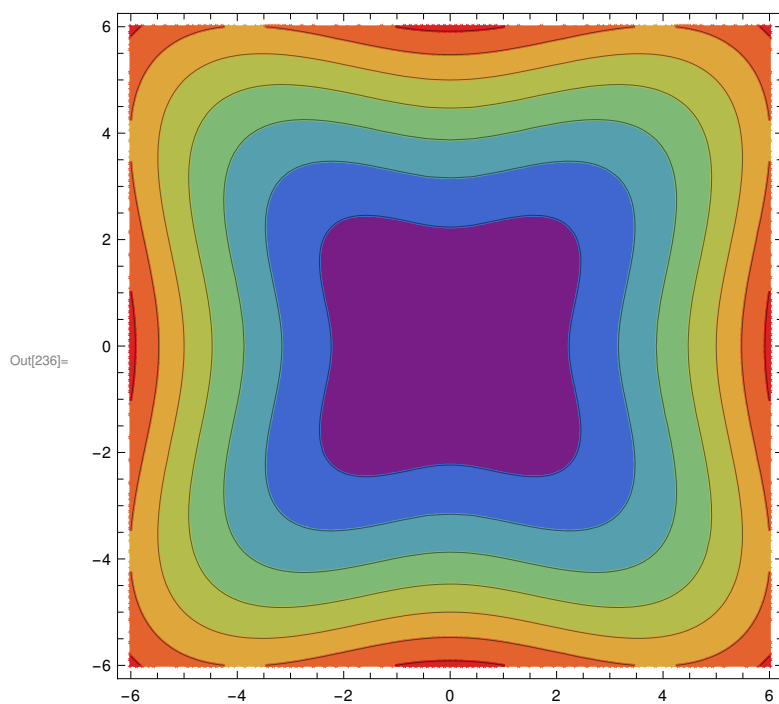
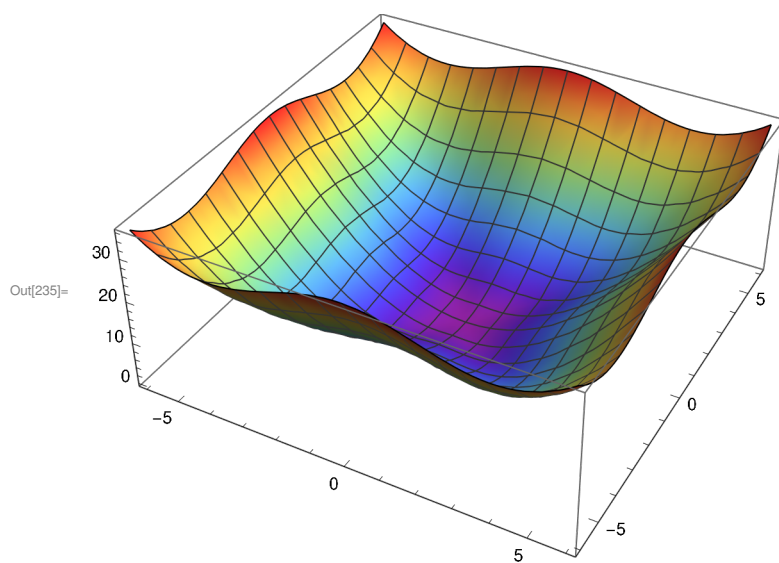
ContourPlot[f, a, b]

Out[231]=
$$\frac{x^4 + y^4}{x^2 + y^2}$$

Out[232]= {x, -6, 6}

Out[233]= {y, -6, 6}

Out[234]= $x^2 + y^2 > 0$



```
In[237]:= (*g*)
f = (Sqrt[x ^ 2 + y ^ 2 + 1] - 1) / (x ^ 2 + y ^ 2)
a = {x, -6, 6}
b = {y, -6, 6}
FunctionDomain[f, {x, y}]
Plot3D[f, a, b]
ContourPlot[f, a, b]

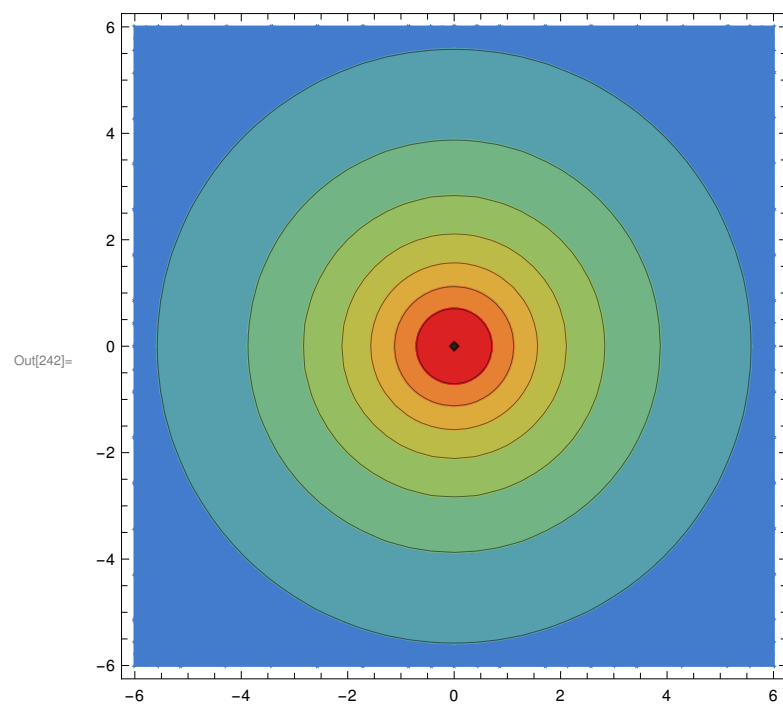
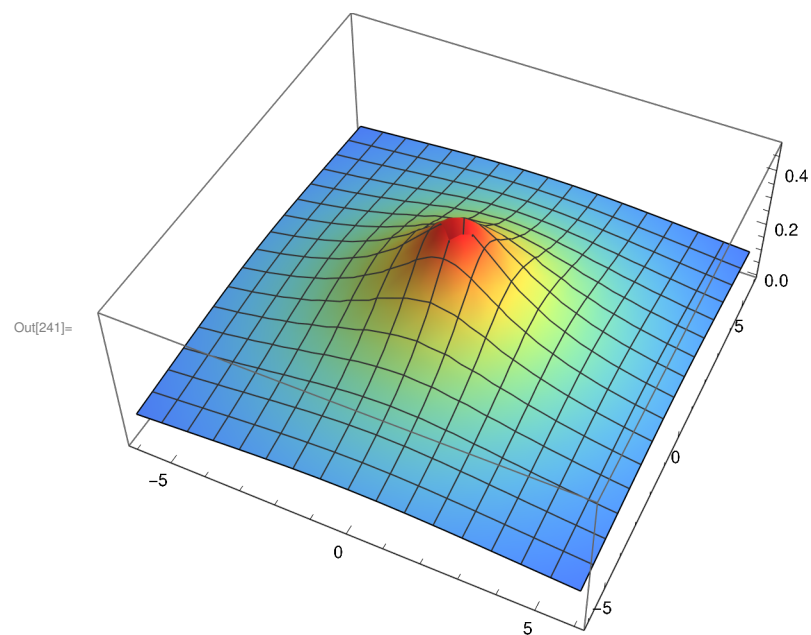
Out[237]= 
$$\frac{-1 + \sqrt{1 + x^2 + y^2}}{x^2 + y^2}$$

```

Out[238]= {x, -6, 6}

Out[239]= {y, -6, 6}

Out[240]= $x^2 + y^2 > 0$



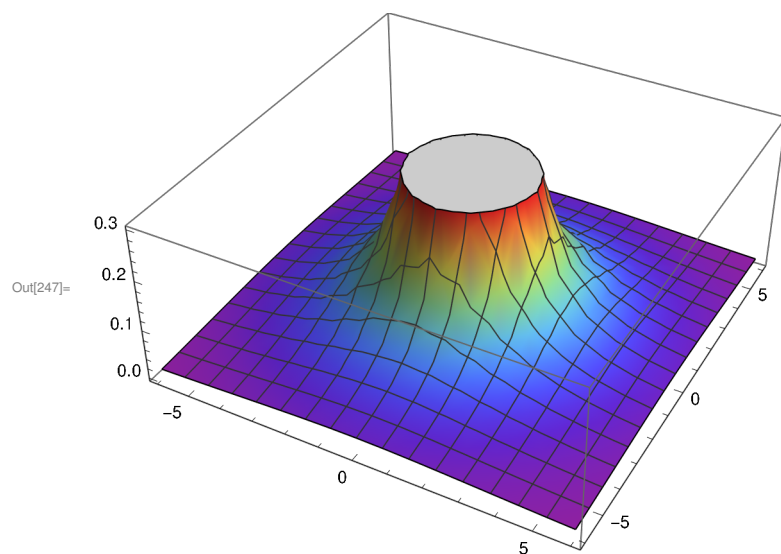
```
In[243]:= (*h*)
f = 1 / (x * x + y * y)
a = {x, -6, 6}
b = {y, -6, 6}
FunctionDomain[f, {x, y}]
Plot3D[f, a, b]
ContourPlot[f, a, b]
```

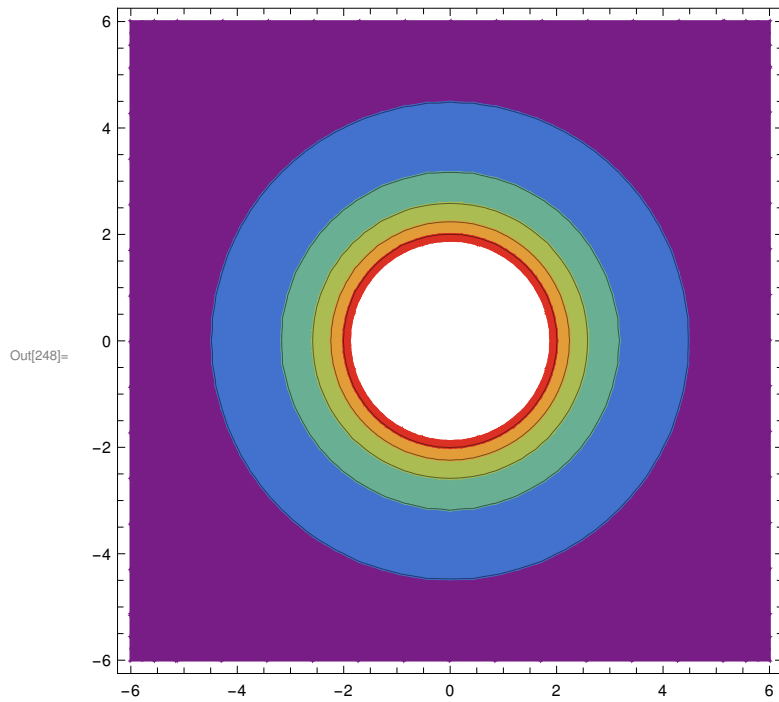
Out[243]=
$$\frac{1}{x^2 + y^2}$$

Out[244]= {x, -6, 6}

Out[245]= {y, -6, 6}

Out[246]= $x^2 + y^2 > 0$





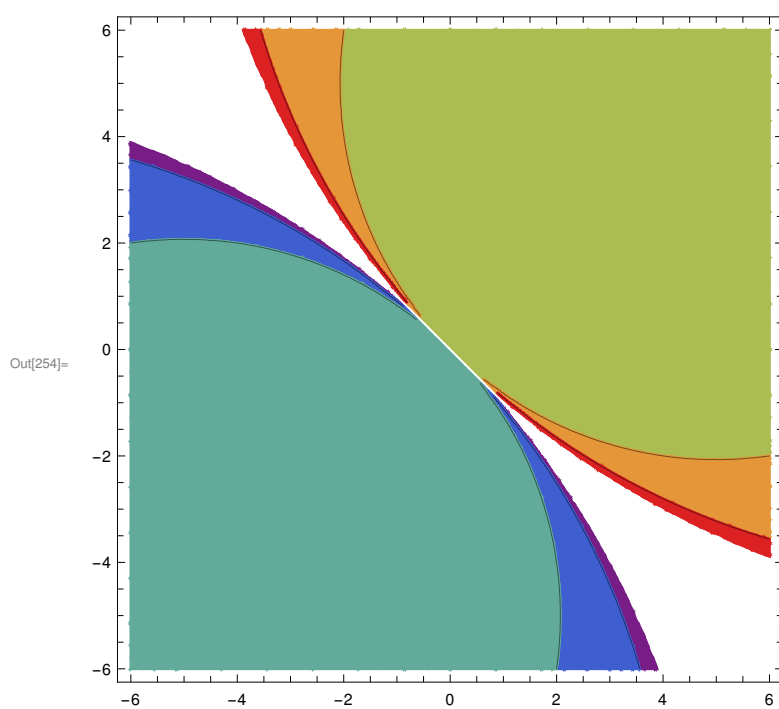
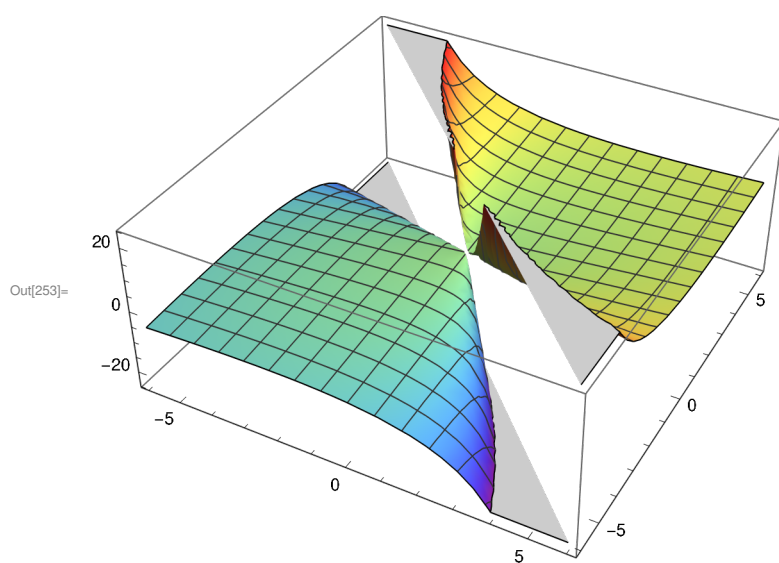
```
In[249]:= (*i*)
f = (x ^ 2 + y ^ 2) / (x + y)
a = {x, -6, 6}
b = {y, -6, 6}
FunctionDomain[f, {x, y}]
Plot3D[f, a, b]
ContourPlot[f, a, b]
```

Out[249]=
$$\frac{x^2 + y^2}{x + y}$$

Out[250]= {x, -6, 6}

Out[251]= {y, -6, 6}

Out[252]= $x + y \neq 0$



In[298]:= **(**)**

In[255]:= **(***)**

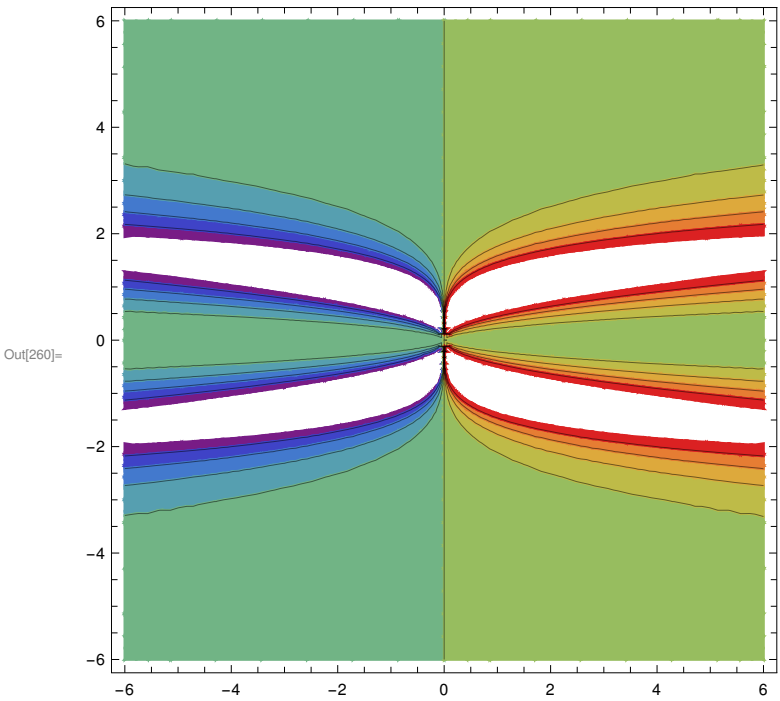
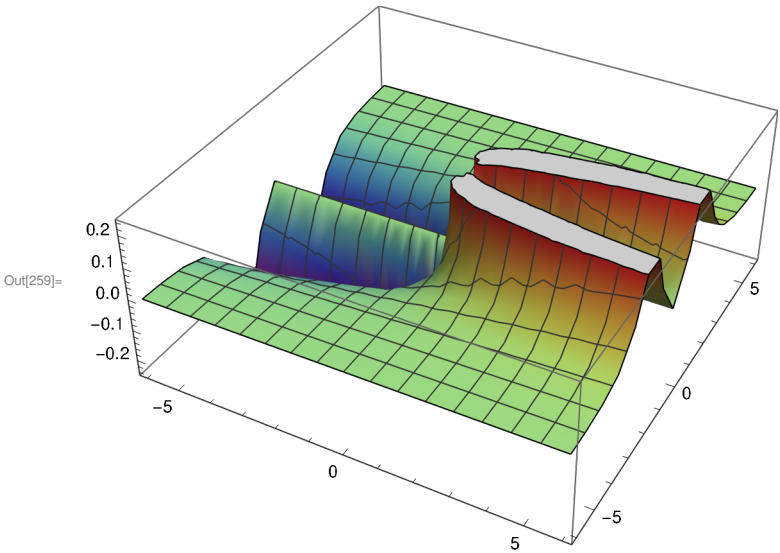
```
f = (x * y^2) / (x^2 + y^6)
a = {x, -6, 6}
b = {y, -6, 6}
FunctionDomain[f, {x, y}]
Plot3D[f, a, b]
ContourPlot[f, a, b]
```

Out[255]=
$$\frac{x y^2}{x^2 + y^6}$$

Out[256]= $\{x, -6, 6\}$

Out[257]= $\{y, -6, 6\}$

Out[258]= $x^2 + y^6 > 0$



In[299]:= **(*l*)**


```

In[267]:= (*m*)
f = (Sin[x * y]) / (Sqrt[x ^ 2 + y ^ 2])
a = {x, -6, 6}
b = {y, -6, 6}
FunctionDomain[f, {x, y}]
Plot3D[f, a, b]
ContourPlot[f, a, b]

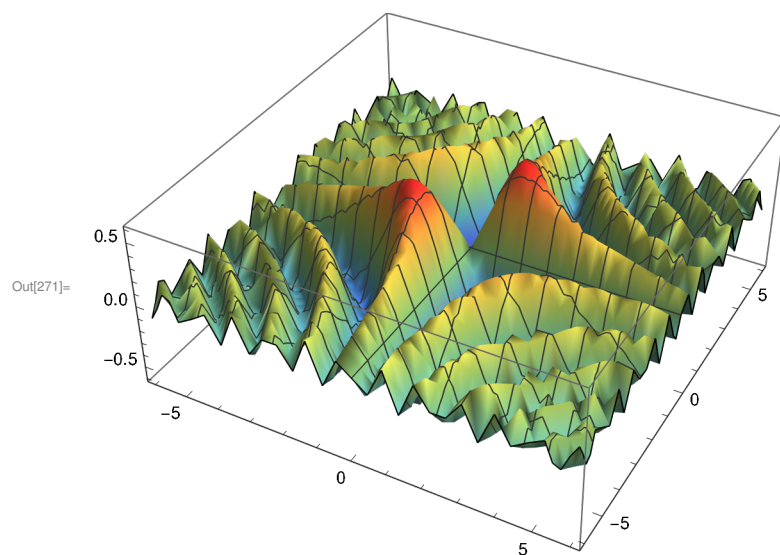
```

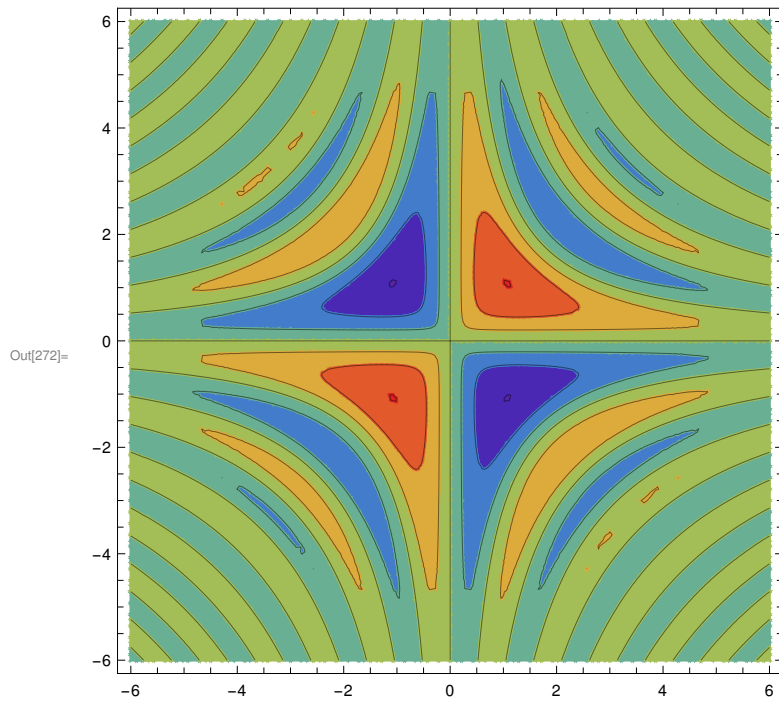
Out[267]=
$$\frac{\sin[xy]}{\sqrt{x^2 + y^2}}$$

Out[268]= {x, -6, 6}

Out[269]= {y, -6, 6}

Out[270]= $x^2 + y^2 > 0$





```
In[273]:= (*n*)
f = (Sin[x * y]) / (x ^ 2 + y ^ 2)
a = {x, -6, 6}
b = {y, -6, 6}
FunctionDomain[f, {x, y}]
Plot3D[f, a, b]
ContourPlot[f, a, b]
```

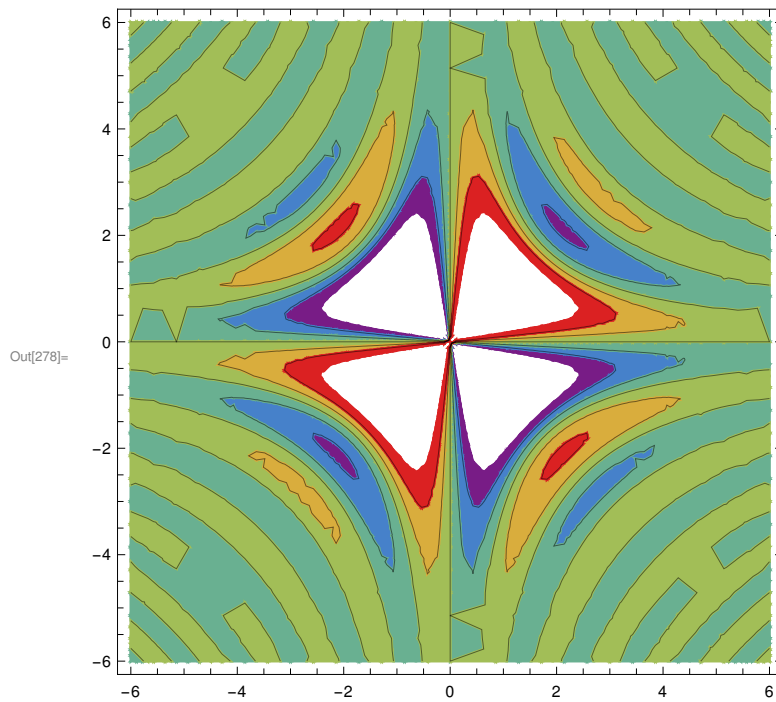
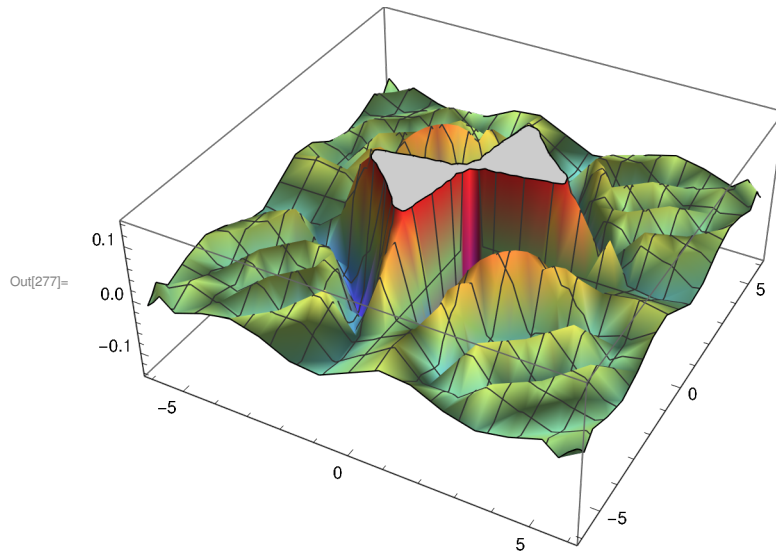
Out[273]=

$$\frac{\sin[xy]}{x^2 + y^2}$$

Out[274]= {x, -6, 6}

Out[275]= {y, -6, 6}

Out[276]= $x^2 + y^2 > 0$



```
In[279]:= (*O*)
f = (x ^ 2 * y) / ((x ^ 2 + y ^ 2) (Sqrt[x ^ 2 + y ^ 2]))
a = {x, -6, 6}
b = {y, -6, 6}
FunctionDomain[f, {x, y}]
Plot3D[f, a, b]
ContourPlot[f, a, b]
```

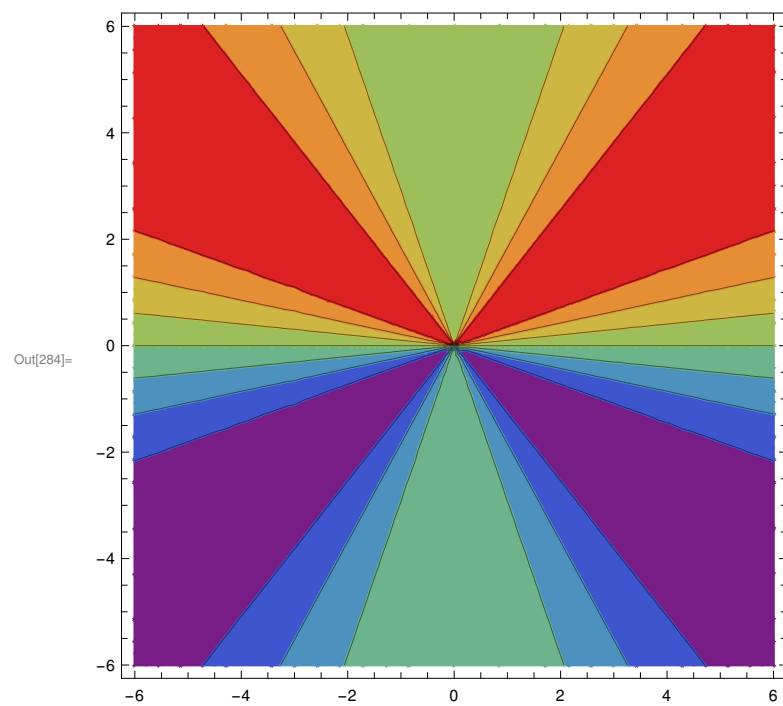
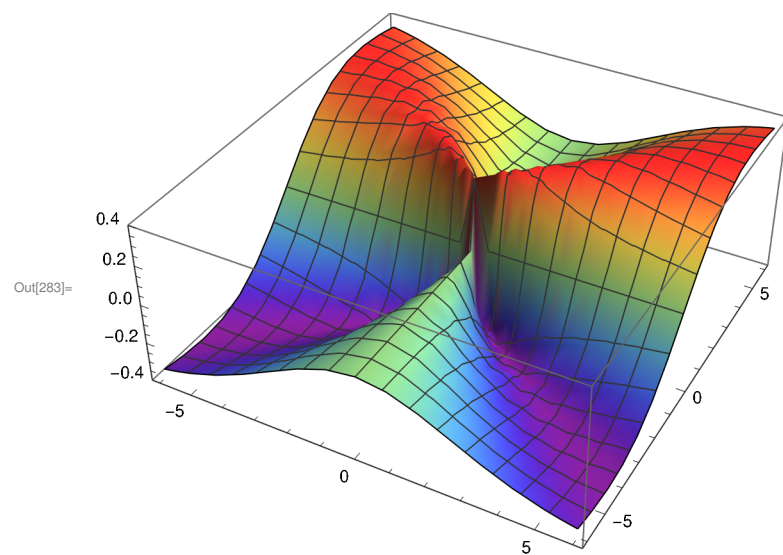
Out[279]=

$$\frac{x^2 y}{(x^2 + y^2)^{3/2}}$$

Out[280]= {x, -6, 6}

Out[281]= {y, -6, 6}

Out[282]= $x^2 + y^2 > 0$



```

In[285]:= (*p*)
f = (y^4 - x * y^2) / ((x^4 + y^2) (Sqrt[x^2 + y^2]))
a = {x, -6, 6}
b = {y, -6, 6}
FunctionDomain[f, {x, y}]
Plot3D[f, a, b]
ContourPlot[f, a, b]

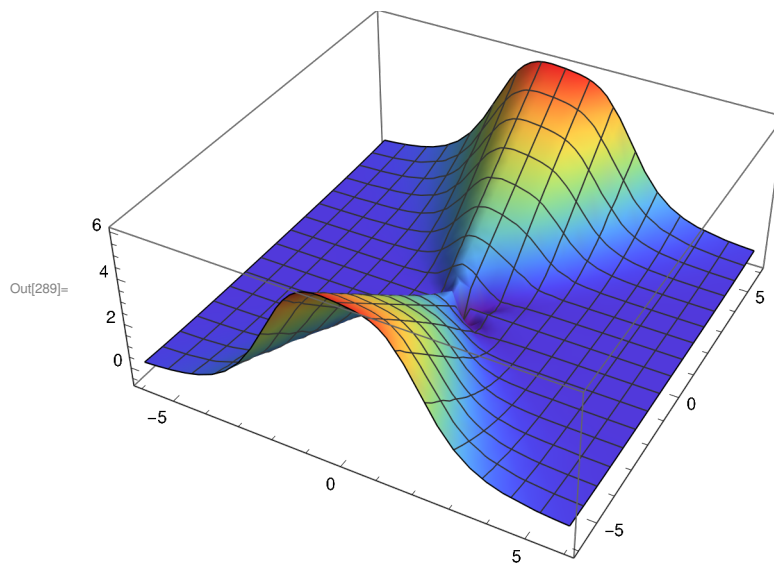
```

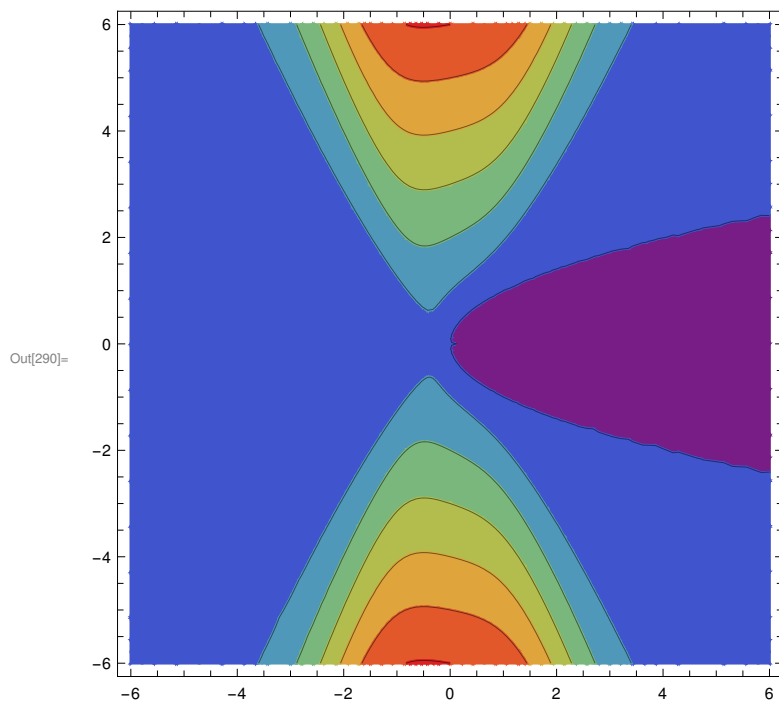
Out[285]=
$$\frac{-x y^2 + y^4}{\sqrt{x^2 + y^2} (x^4 + y^2)}$$

Out[286]= {x, -6, 6}

Out[287]= {y, -6, 6}

Out[288]= $x^2 + y^2 > 0 \ \&\& \ x^4 + y^2 > 0$





In[291]=

(*q*)

$$f = \frac{x^2 y (Abs[x] + Abs[y])}{(x^4 + y^2) (Sqrt[x^2 + y^2])}$$

$$a = \{x, -6, 6\}$$

$$b = \{y, -6, 6\}$$

$$\text{FunctionDomain}[f, \{x, y\}]$$

$$\text{Plot3D}[f, a, b]$$

$$\text{ContourPlot}[f, a, b]$$

Out[291]=

$$\frac{x^2 y (Abs[x] + Abs[y])}{\sqrt{x^2 + y^2} (x^4 + y^2)}$$

Out[292]=

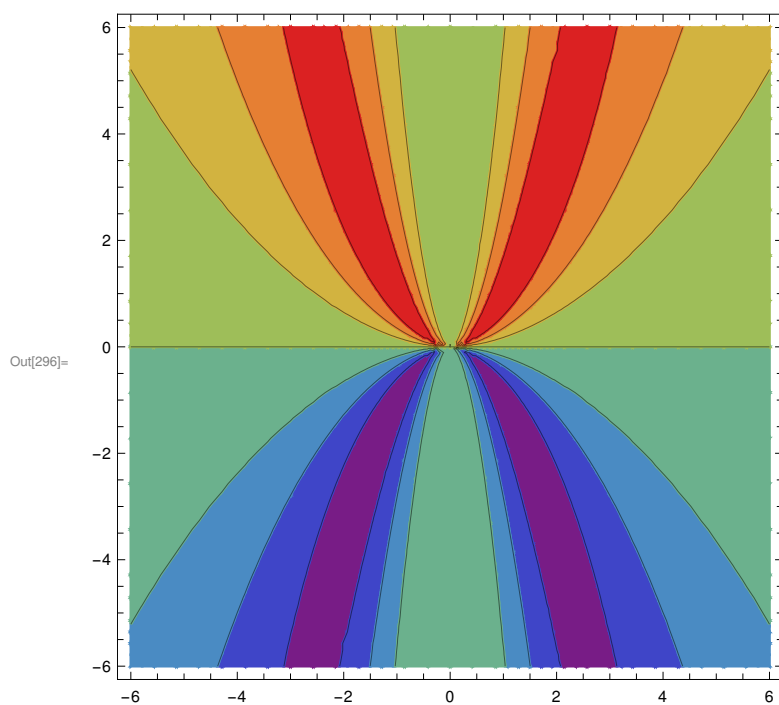
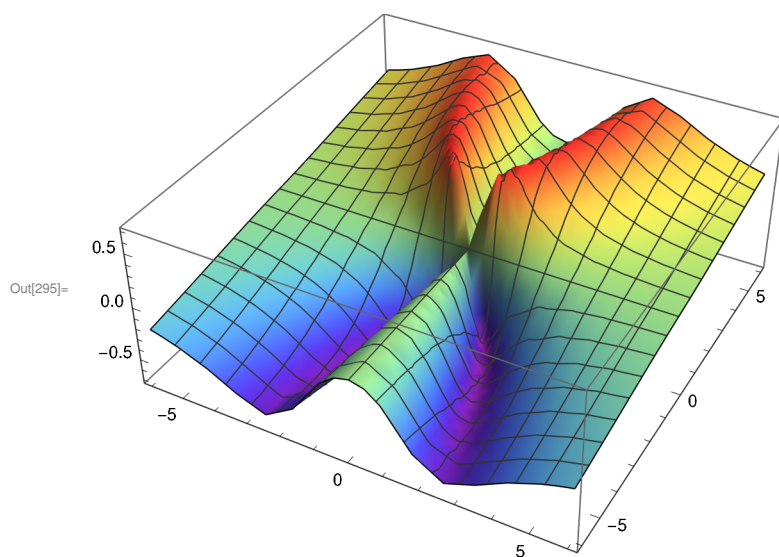
$$\{x, -6, 6\}$$

Out[293]=

$$\{y, -6, 6\}$$

Out[294]=

$$x^2 + y^2 > 0 \ \&\& \ x^4 + y^2 > 0$$



```
In[505]:= (*Ukazka*)
f = (x ^ 2 + y ^ 2 + z ^ 2)
a = {x, -6, 6}
b = {y, -6, 6}
c = {z, -6, 6}
FunctionDomain[f, {x, y, z}]
Plot3D[Evaluate@Table[f, {z, {-3, 1, 2, 5}}], a, b, PlotStyle -> {Red, Green, Blue}]
Manipulate[
  ContourPlot[(x ^ 2 + y ^ 2 + z ^ 2), a, b, ColorFunction -> "DarkRainbow"], {z, -6, 6}]
ContourPlot3D[f, {x, -2, 2}, {y, -2, 2}, {z, -2, 2}]
```

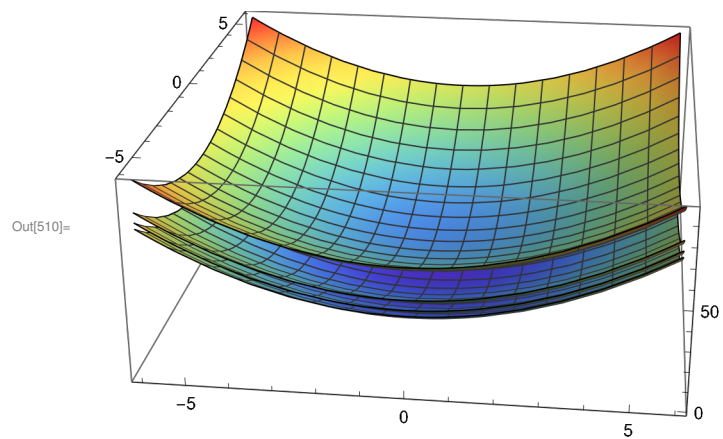
Out[505]= $x^2 + y^2 + z^2$

Out[506]= $\{x, -6, 6\}$

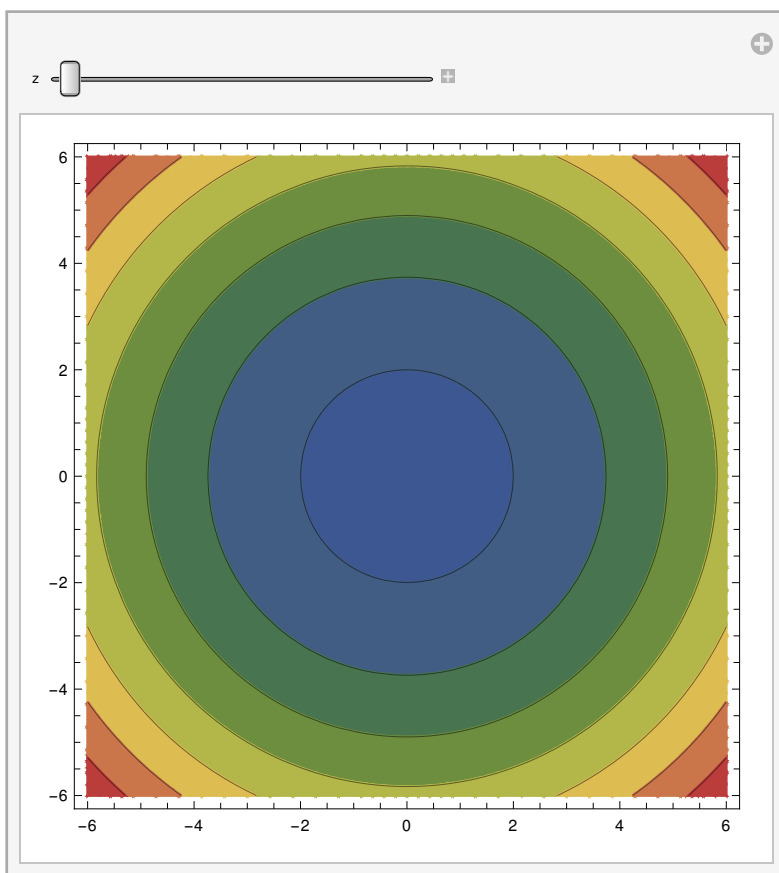
Out[507]= $\{y, -6, 6\}$

Out[508]= $\{z, -6, 6\}$

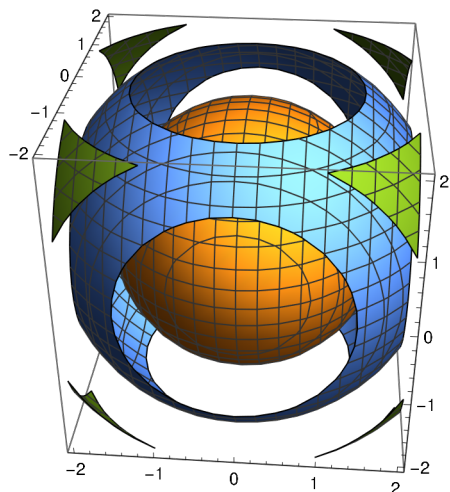
Out[509]= True



Out[511]=



Out[512]=



In[489]:=

(*)**

$$f = (x^2) / (x^2 + y^2 + z^2)$$

$$a = \{x, -6, 6\}$$

$$b = \{y, -6, 6\}$$

$$c = \{z, -6, 6\}$$

FunctionDomain[f, {x, y, z}]

Plot3D[Evaluate@Table[f, {z, {-3, 1, 5}}], a, b, PlotStyle → {Red, Green, Blue}]

Manipulate[

ContourPlot[(x^2)/(x^2+y^2+z^2), a, b, ColorFunction → "DarkRainbow", {z, -6, 6}]

ContourPlot3D[f, {x, -2, 2}, {y, -2, 2}, {z, -2, 2}]

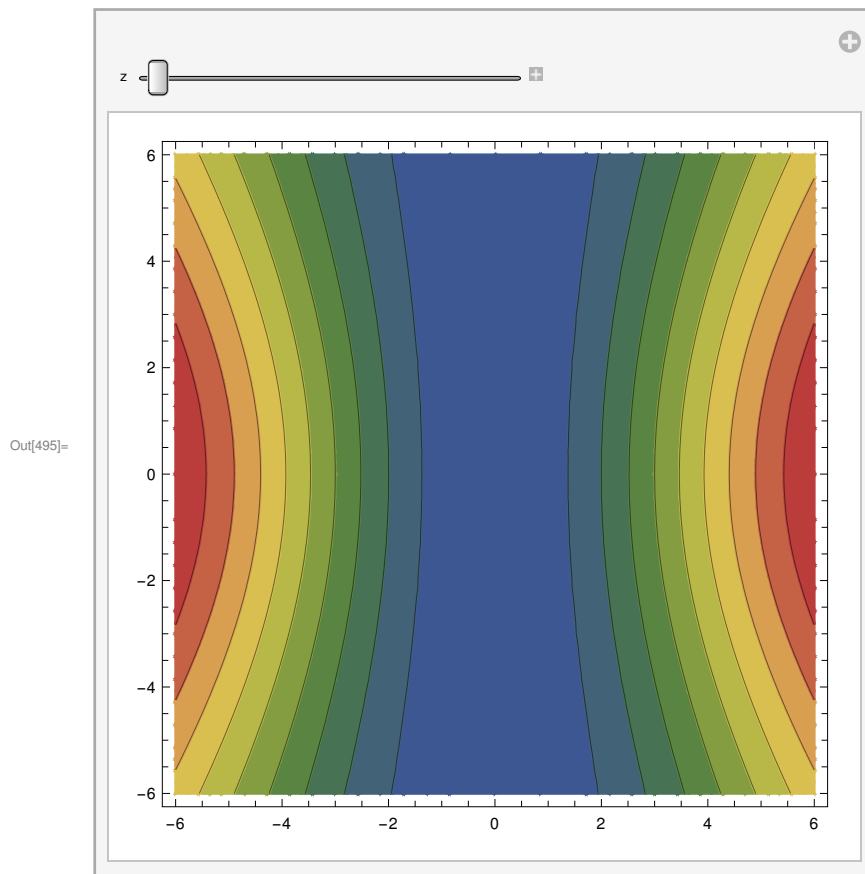
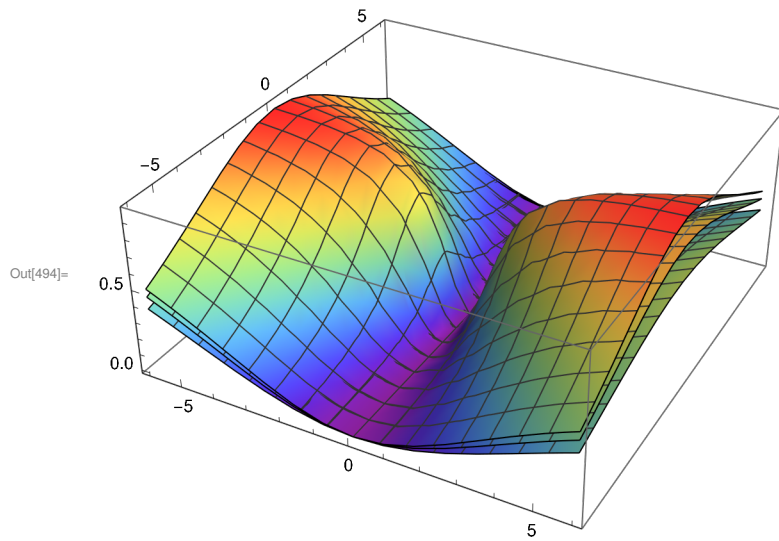
$$\text{Out[489]} = \frac{x^2}{x^2 + y^2 + z^2}$$

$$\text{Out[490]} = \{x, -6, 6\}$$

$$\text{Out[491]} = \{y, -6, 6\}$$

$$\text{Out[492]} = \{z, -6, 6\}$$

$$\text{Out[493]} = x^2 + y^2 + z^2 > 0$$



... **Power** : Infinite expression $\frac{1}{0.}$ encountered .

... **Infinity** : Indeterminate expression 0. ComplexInfinity encountered .

... **Power** : Infinite expression $\frac{1}{0.}$ encountered .

... **Infinity** : Indeterminate expression 0. ComplexInfinity encountered .

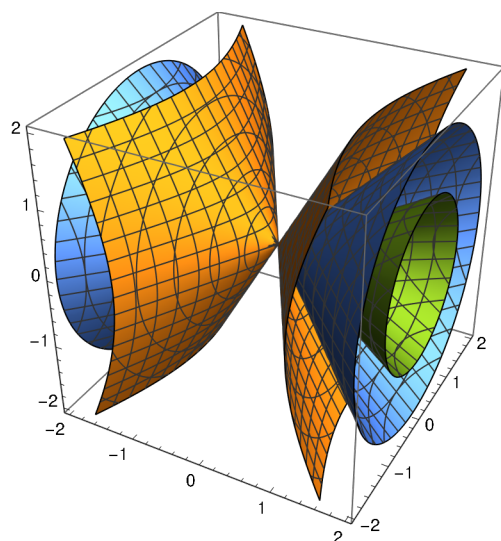
... **Power** : Infinite expression $\frac{1}{0.}$ encountered .

... **General** : Further output of Power::infy will be suppressed during this calculation .

... **Infinity** : Indeterminate expression 0. ComplexInfinity encountered .

... **General** : Further output of Infinity::indet will be suppressed during this calculation .

Out[496]=



... **General** : Further output of Power::infy will be suppressed during this calculation .