コンピュータでやってみた_4-1.ipynb

多変数関数の極限値が存在しない例

In [1]:
```
using Plots
```

In [2]:
```
f(x,y) = x^2*y / (x^4 + y^2)
```

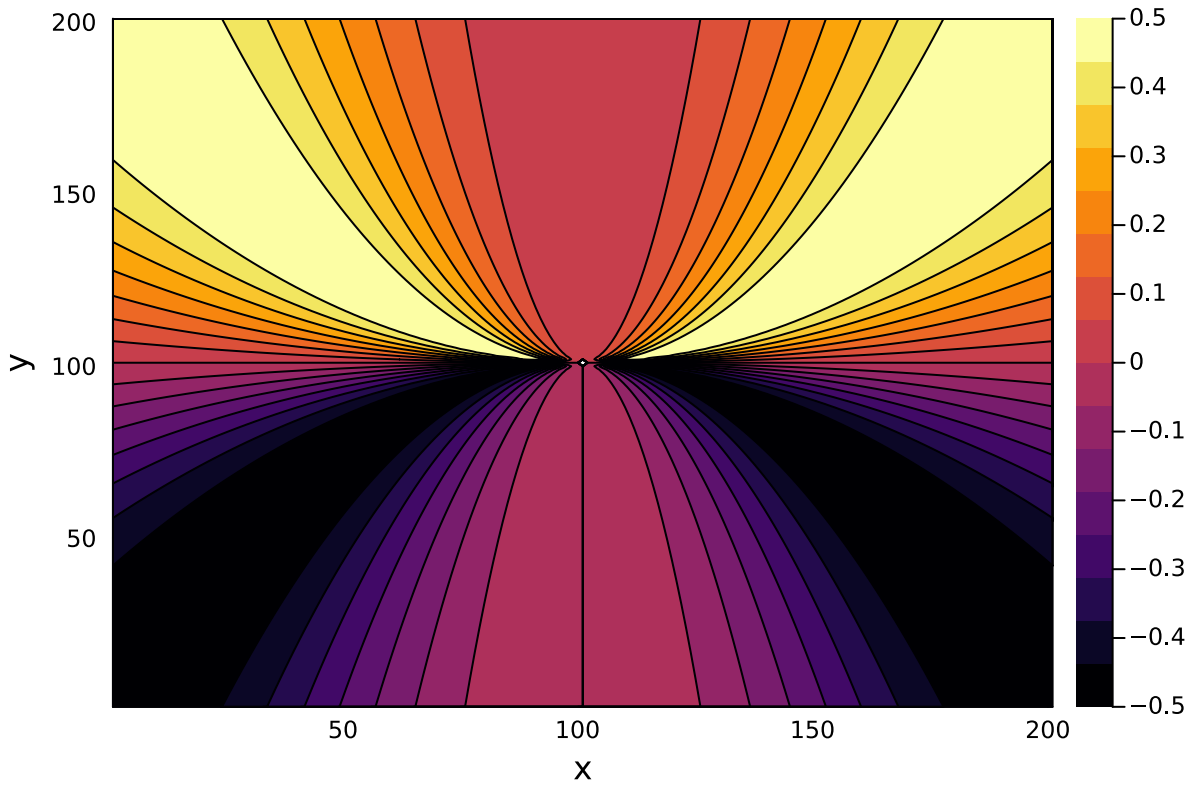
Out [2]: f (generic function with 1 method)

In [3]:
```
A = [ f(x,y) for x in -1:0.01:1, y in -1:0.01:1 ]
```

Out [3]:
```
201×201 Matrix{Float64}:
 -0.5       -0.499975  -0.499898  -0.499768  …  0.499898  0.499975  0.5
 -0.499899  -0.499975  -0.5       -0.499973     0.5       0.499975  0.499899
 -0.499592  -0.49977   -0.499898  -0.499975     0.499898  0.49977   0.499592
 -0.499074  -0.499354  -0.499586  -0.499768     0.499586  0.499354  0.499074
 -0.498338  -0.498721  -0.499058  -0.499346     0.499058  0.498721  0.498338
 -0.49738   -0.497867  -0.498308  -0.498702  …  0.498308  0.497867  0.49738
 -0.496196  -0.496785  -0.497331  -0.497832     0.497331  0.496785  0.496196
 -0.494779  -0.495472  -0.496123  -0.49673      0.496123  0.495472  0.494779
 -0.493127  -0.493922  -0.494678  -0.495391     0.494678  0.493922  0.493127
 -0.491235  -0.492133  -0.492992  -0.493811     0.492992  0.492133  0.491235
 -0.489101  -0.490099  -0.491061  -0.491985  …  0.491061  0.490099  0.489101
 -0.486721  -0.487818  -0.488882  -0.48991      0.488882  0.487818  0.486721
 -0.484092  -0.485288  -0.486452  -0.487583     0.486452  0.485288  0.484092
  ⋮                                  ⋱                    ⋮
 -0.486721  -0.487818  -0.488882  -0.48991      0.488882  0.487818  0.486721
 -0.489101  -0.490099  -0.491061  -0.491985  …  0.491061  0.490099  0.489101
 -0.491235  -0.492133  -0.492992  -0.493811     0.492992  0.492133  0.491235
 -0.493127  -0.493922  -0.494678  -0.495391     0.494678  0.493922  0.493127
 -0.494779  -0.495472  -0.496123  -0.49673      0.496123  0.495472  0.494779
 -0.496196  -0.496785  -0.497331  -0.497832     0.497331  0.496785  0.496196
 -0.49738   -0.497867  -0.498308  -0.498702  …  0.498308  0.497867  0.49738
 -0.498338  -0.498721  -0.499058  -0.499346     0.499058  0.498721  0.498338
 -0.499074  -0.499354  -0.499586  -0.499768     0.499586  0.499354  0.499074
 -0.499592  -0.49977   -0.499898  -0.499975     0.499898  0.49977   0.499592
 -0.499899  -0.499975  -0.5       -0.499973     0.5       0.499975  0.499899
 -0.5       -0.499975  -0.499898  -0.499768  …  0.499898  0.499975  0.5
```

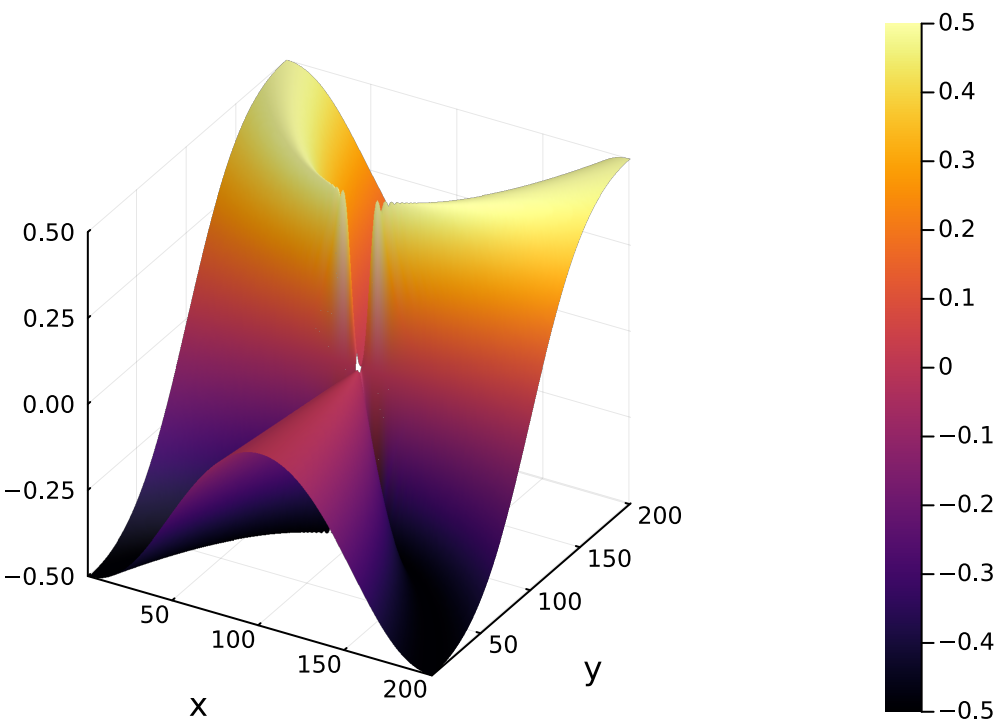
In [9]:
```
default( xlabel = "x", ylabel = "y")
contour(A', fill = true )
# x,y の変化の向きによる行列への値の格納順序が、図の軸の向きと違うので、行列を転置して
```

Out [9]:



In [10]:
```
surface(A')
```

Out [10]:



多変数関数の偏微分

In [11]:
```
using SymPy
```

In [12]:
```
@syms t,s
```

Out [12]: (t, s)

In [15]:
```
g = SymPy.atan(t/s)
```

Out [15]:
```
    /t\
atan|-|
    \s/
```

In [16]:
```
diff( g, t )
```

Out [16]:
```
    1
----------
  /     2\
  |    t |
s*|1 + --|
  |     2|
  \    s /
```

In [17]:
```
diff( g, s )
```

Out [17]:
```
    -t
-----------
   /     2\
 2 |    t |
s *|1 + --|
   |     2|
   \    s /
```

In [ ]:

Hey there! If you have any feedback for this tool - issues, ideas for improvement, or you want to just tell me about your use case for this, I'd love to know. E-mail me or tweet at me.