In[19]:=
```
f = Sqrt[x^2 + y^2] + Sqrt[1 - x^2] + Sqrt[1 - y^2]
```

Out[19]=
$$\sqrt{1-x^2}+\sqrt{1-y^2}+\sqrt{x^2+y^2}$$

In[20]:=
```
gradijent = D[f, {{x, y}}]
```

Out[20]=
$$\left\{-\frac{x}{\sqrt{1-x^2}}+\frac{x}{\sqrt{x^2+y^2}},\ -\frac{y}{\sqrt{1-y^2}}+\frac{y}{\sqrt{x^2+y^2}}\right\}$$

In[21]:=
```
Tacke = Solve[gradijent == 0, {x, y}]
```

Out[21]=
$$\left\{\left\{x\to-\frac{1}{\sqrt{2}},\ y\to 0\right\},\ \left\{x\to\frac{1}{\sqrt{2}},\ y\to 0\right\},\right.$$
$$\left\{x\to 0,\ y\to-\frac{1}{\sqrt{2}}\right\},\ \left\{x\to 0,\ y\to\frac{1}{\sqrt{2}}\right\},\ \left\{x\to-\frac{1}{\sqrt{3}},\ y\to-\frac{1}{\sqrt{3}}\right\},$$
$$\left.\left\{x\to\frac{1}{\sqrt{3}},\ y\to-\frac{1}{\sqrt{3}}\right\},\ \left\{x\to-\frac{1}{\sqrt{3}},\ y\to\frac{1}{\sqrt{3}}\right\},\ \left\{x\to\frac{1}{\sqrt{3}},\ y\to\frac{1}{\sqrt{3}}\right\}\right\}$$

In[22]:=
```
Hodf = Simplify[D[f, {{x, y}, 2}]]
```

Out[22]=
$$\left\{\left\{-\frac{1}{\sqrt{1-x^2}}+\frac{1}{\sqrt{x^2+y^2}}+x^2\left(-\frac{1}{\left(1-x^2\right)^{3/2}}-\frac{1}{\left(x^2+y^2\right)^{3/2}}\right),\ -\frac{x\,y}{\left(x^2+y^2\right)^{3/2}}\right\},\right.$$
$$\left.\left\{-\frac{x\,y}{\left(x^2+y^2\right)^{3/2}},\ -\frac{1}{\sqrt{1-y^2}}+\frac{1}{\sqrt{x^2+y^2}}+y^2\left(-\frac{1}{\left(1-y^2\right)^{3/2}}-\frac{1}{\left(x^2+y^2\right)^{3/2}}\right)\right\}\right\}$$

In[23]:=
```
HodfM = MatrixForm[Hodf]
```

Out[23]//MatrixForm=
$$\begin{pmatrix} -\frac{1}{\sqrt{1-x^2}}+\frac{1}{\sqrt{x^2+y^2}}+x^2\left(-\frac{1}{\left(1-x^2\right)^{3/2}}-\frac{1}{\left(x^2+y^2\right)^{3/2}}\right) & -\frac{x\,y}{\left(x^2+y^2\right)^{3/2}} \\ -\frac{x\,y}{\left(x^2+y^2\right)^{3/2}} & -\frac{1}{\sqrt{1-y^2}}+\frac{1}{\sqrt{x^2+y^2}}+y^2\left(-\frac{1}{\left(1-y^2\right)^{3/2}}-\frac{1}{\left(x^2+y^2\right)^{3/2}}\right) \end{pmatrix}$$

In[24]:=
```
HodfuTacke = Hodf /. Tacke
```

Out[24]=
$$\left\{\left\{\left\{-2\sqrt{2},\ 0\right\},\ \left\{0,\ -1+\sqrt{2}\right\}\right\},\ \left\{\left\{-2\sqrt{2},\ 0\right\},\ \left\{0,\ -1+\sqrt{2}\right\}\right\},\right.$$
$$\left\{\left\{-1+\sqrt{2},\ 0\right\},\ \left\{0,\ -2\sqrt{2}\right\}\right\},\ \left\{\left\{-1+\sqrt{2},\ 0\right\},\ \left\{0,\ -2\sqrt{2}\right\}\right\},$$
$$\left\{\left\{-\sqrt{\frac{3}{2}},\ -\frac{\sqrt{\frac{3}{2}}}{2}\right\},\ \left\{-\frac{\sqrt{\frac{3}{2}}}{2},\ -\sqrt{\frac{3}{2}}\right\}\right\},\ \left\{\left\{-\sqrt{\frac{3}{2}},\ \frac{\sqrt{\frac{3}{2}}}{2}\right\},\ \left\{\frac{\sqrt{\frac{3}{2}}}{2},\ -\sqrt{\frac{3}{2}}\right\}\right\},$$
$$\left.\left\{\left\{-\sqrt{\frac{3}{2}},\ \frac{\sqrt{\frac{3}{2}}}{2}\right\},\ \left\{\frac{\sqrt{\frac{3}{2}}}{2},\ -\sqrt{\frac{3}{2}}\right\}\right\},\ \left\{\left\{-\sqrt{\frac{3}{2}},\ -\frac{\sqrt{\frac{3}{2}}}{2}\right\},\ \left\{-\frac{\sqrt{\frac{3}{2}}}{2},\ -\sqrt{\frac{3}{2}}\right\}\right\}\right\}$$

In[25]:=
```
minf = Map[PositiveDefiniteMatrixQ, HodfuTacke, 1]
```

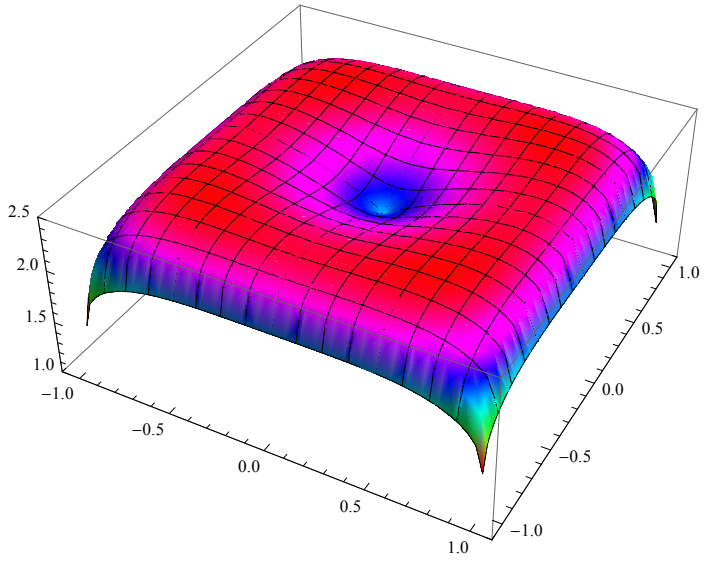
Out[25]=
```
{False, False, False, False, False, False, False, False}
```

In[26]:=
```
maxf = Map[PositiveDefiniteMatrixQ, -HodfuTacke, 1]
```

Out[26]=
```
{False, False, False, False, True, True, True, True}
```

In[27]:=
```
Plot3D[f, {x, -1, 1}, {y, -1, 1}, ColorFunction → Hue,
 PlotRange → {{-1.1, 1.1}, {-1.1, 1.1}, {1, 2.5}}]
```

Out[27]=



In[28]:=
```
Show[%27, ImageSize → Full]
```

Out[28]=