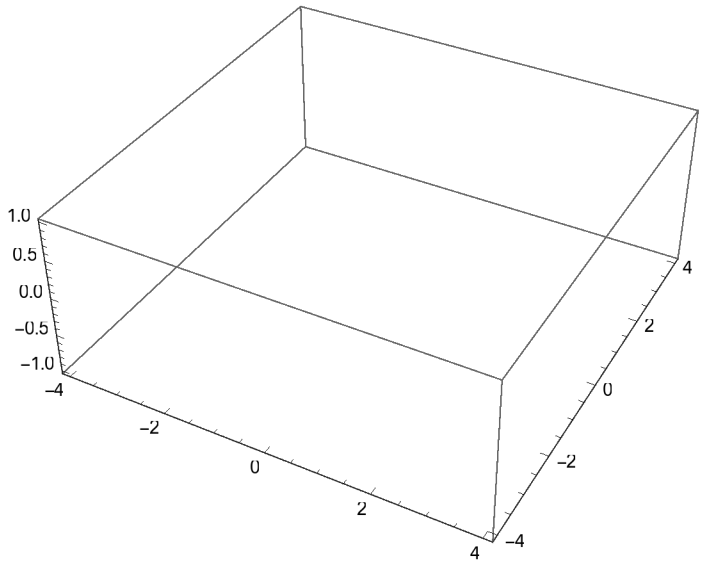
In[34]:=
```
f[x_, y_] := Exp[(-1 / (2 (1 - r^2)))
    (( ((x - m1) / s1)^2 - 2 r (x - m1) / s1 (y - m2) / s2) + ((y - m2) / s2)^2)] / (2
    Pi s1 s2 Sqrt[1 - r^2])
```

In[25]:=
```
Plot3D[f[x, y], {x, -4, 4}, {y, -4, 4}]
```

Out[25]=



In[35]:=
```
f[x, y]
```

Out[35]=
$$e^{-\frac{\frac{(-m1+x)^2}{s1^2}-\frac{2\,r\,(-m1+x)\,(-m2+y)}{s1\,s2}+\frac{(-m2+y)^2}{s2^2}}{2\,(1-r^2)}} \Big/ \left(2\,\pi\,\sqrt{1-r^2}\;s1\,s2\right)$$

In[36]:=
```
f[x, y] /. m1 → 0
```

Out[36]=
$$e^{-\frac{\frac{x^2}{s1^2}-\frac{2\,r\,x\,(-m2+y)}{s1\,s2}+\frac{(-m2+y)^2}{s2^2}}{2\,(1-r^2)}} \Big/ \left(2\,\pi\,\sqrt{1-r^2}\;s1\,s2\right)$$

In[37]:=
```
% /. m2 → 0
```

Out[37]=
$$\frac{e^{-\frac{\frac{x^2}{s1^2}-\frac{2\,r\,x\,y}{s1\,s2}+\frac{y^2}{s2^2}}{2\,(1-r^2)}}}{2\,\pi\,\sqrt{1-r^2}\;s1\,s2}$$

In[38]:=
```
% /. s1 → 1
```

Out[38]=
$$\frac{e^{-\frac{x^2-\frac{2\,r\,x\,y}{s2}+\frac{y^2}{s2^2}}{2\,(1-r^2)}}}{2\,\pi\,\sqrt{1-r^2}\;s2}$$

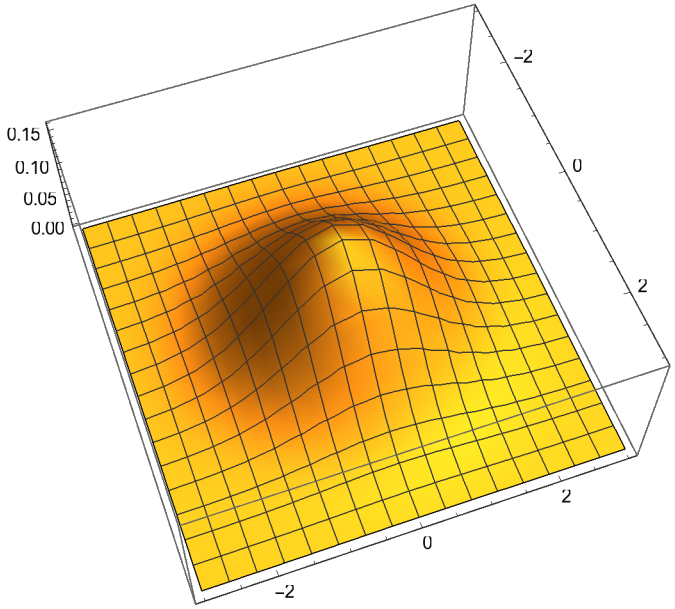
In[39]:=
```
% /. s2 → 1
```

Out[39]=
$$\frac{e^{-\frac{x^2-2\,r\,x\,y+y^2}{2\,(1-r^2)}}}{2\,\pi\,\sqrt{1-r^2}}$$

In[40]:=
```
% /. r → 0
```

Out[40]=
$$\frac{e^{\frac{1}{2}\left(-x^2-y^2\right)}}{2\,\pi}$$

In[46]:=
```
Plot3D[Out[40], {x, -3, 3}, {y, -3, 3}]
```

Out[46]=


In[48]:=
```
Integrate[Out[40], {x, -Infinity, Infinity}]
```

Out[48]=
$$\frac{e^{-\frac{y^2}{2}}}{\sqrt{2\,\pi}}$$

In[49]:=
```
Integrate[%, {y, -Infinity, Infinity}]
```

Out[49]=
```
1
```

In[51]:=
```
Manipulate[{r, Plot3D[Out[39], {x, -3, 3}, {y, -3, 3}]}, {r, -.9, .9}]
```

Out[51]=