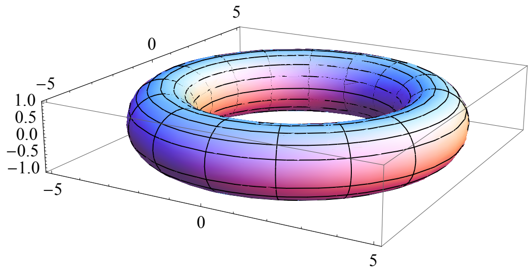
In[35]:=
```
p[u_, v_] = {(a + b * Cos[u]) Cos[v], (a + b * Cos[u]) Sin[v], b * Sin[u]}
```
Out[35]=
```
{(a + b Cos[u]) Cos[v], (a + b Cos[u]) Sin[v], b Sin[u]}
```

In[36]:=
```
ParametricPlot3D[p[u, v] /. {a → 4, b → 1}, {u, 0, 2 Pi}, {v, 0, 2 Pi}]
```
Out[36]=



In[37]:=
```
dp[u_, v_] = d[p[u, v]] /. {d[a] → 0, d[b] → 0}
```
Out[37]=
```
{-b Cos[v] d[u] Sin[u] - a d[v] Sin[v] - b Cos[u] d[v] Sin[v],
 a Cos[v] d[v] + b Cos[u] Cos[v] d[v] - b d[u] Sin[u] Sin[v], b Cos[u] d[u]}
```

In[38]:=
```
Simplify[Dot[dp[u, v], dp[u, v]]]
```
Out[38]=

$$\frac{1}{2}\left(2\, b^2\, d[u]^2 + 2\,(a + b\, \mathrm{Cos}[u])^2\, d[v]^2\right)$$

In[39]:=
```
EE[u_, v_] = b^2
```
Out[39]= b^2

In[40]:=
```
FF[u_, v_] = 0
```
Out[40]= 0

In[41]:=
```
GG[u_, v_] = (a + b Cos[u])^2
```
Out[41]= $(a + b\, \mathrm{Cos}[u])^2$

In[42]:=
```
f[u_, v_] = Sqrt[EE[u, v] * GG[u, v] - (FF[u, v])^2]
```
Out[42]= $\sqrt{\left(b^2\,(a + b\, \mathrm{Cos}[u])^2\right)}$

In[43]:=
```
Integrate[b * (a + b Cos[u]), {u, 0, 2 Pi}, {v, 0, 2 Pi}]
```
Out[43]= $4\, a\, b\, \pi^2$