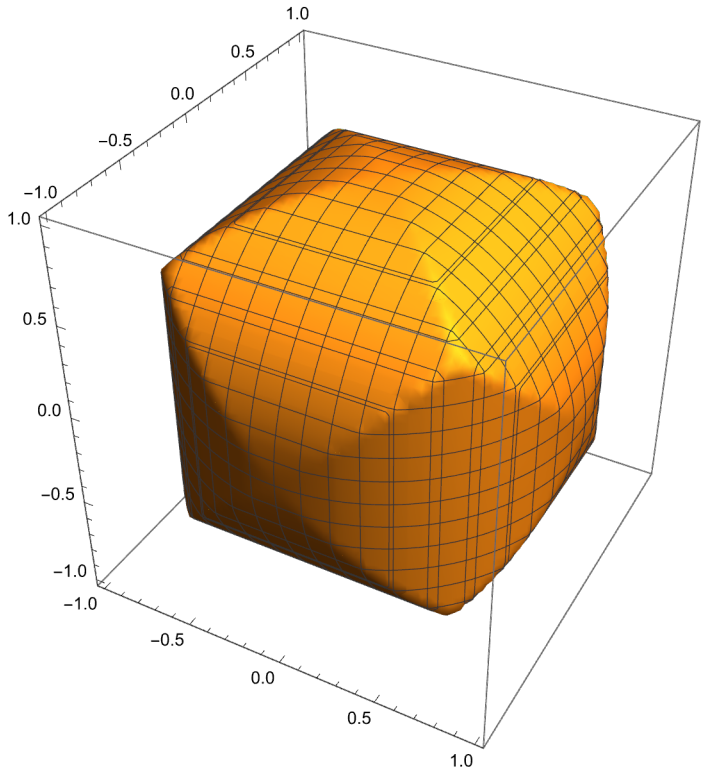
牟合方盖

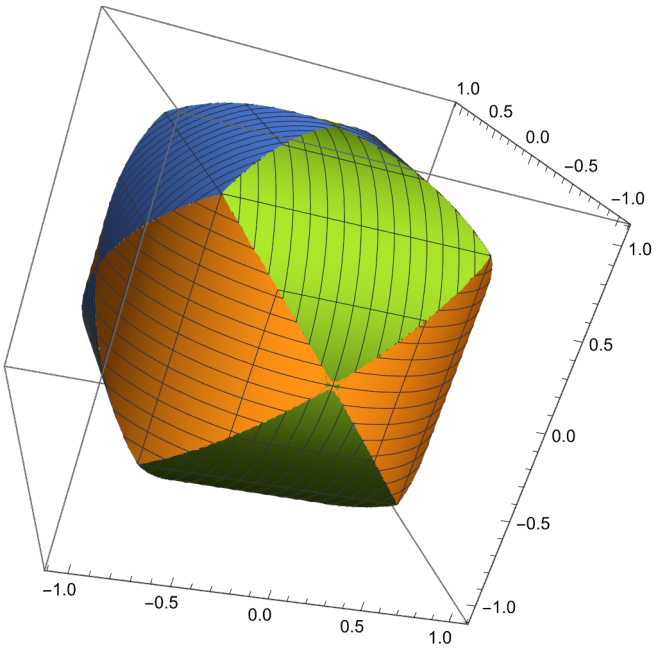
In[ ]:=
```
RegionPlot3D[x^2 + y^2 ≤ 1 && x^2 + z^2 ≤ 1 && y^2 + z^2 ≤ 1,
 {x, -1, 1}, {y, -1, 1}, {z, -1, 1}, PlotPoints → 50]
```
三维区域图
绘图点

Out[ ]=



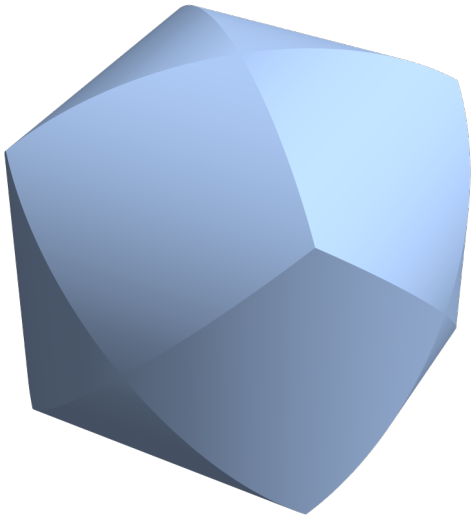
In[ ]:=
```
ParametricPlot3D[{{Cos[u], Sin[u], v}, {Cos[u], v, Sin[u]}, {v, Cos[u], Sin[u]}},
 {u, 0, 2 π}, {v, -1, 1}, PlotPoints → 50,
 RegionFunction → ({x, y, z} ↦ x^2 + y^2 ≤ 1 && x^2 + z^2 ≤ 1 && y^2 + z^2 ≤ 1)]
```
绘制三维参数图 余弦 正弦 余弦 正弦 余弦 正弦 绘图点 区域函数

Out[ ]=



In[ ]:=
```
region = CSGRegion["Intersection",
          CSG区域      交集
  {c, Rotate[c, Pi / 2, {0, 1, 0}], Rotate[c, Pi / 2, {1, 0, 0}]} /. c → Cylinder[]]
      旋转      圆周率          旋转      圆周率                    圆柱体
```

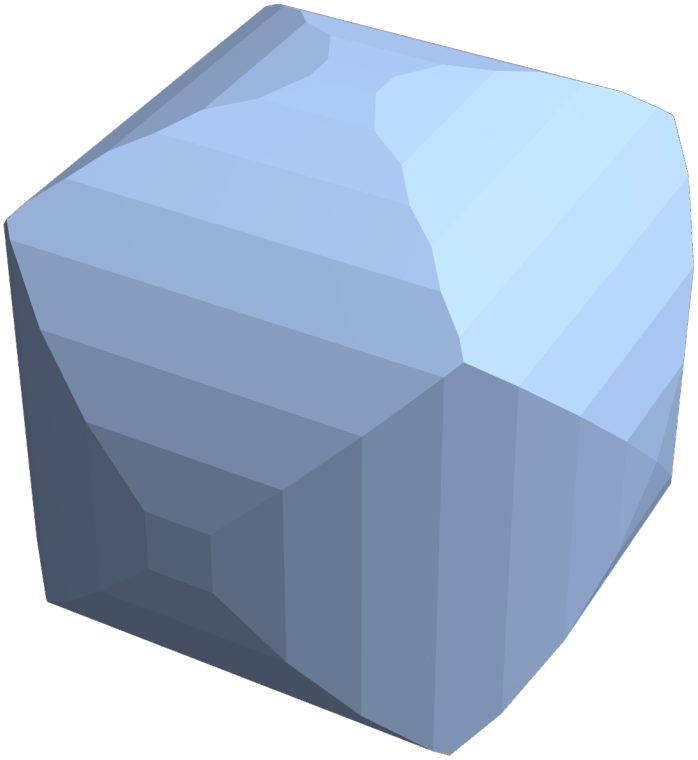
Out[ ]=



计算体积

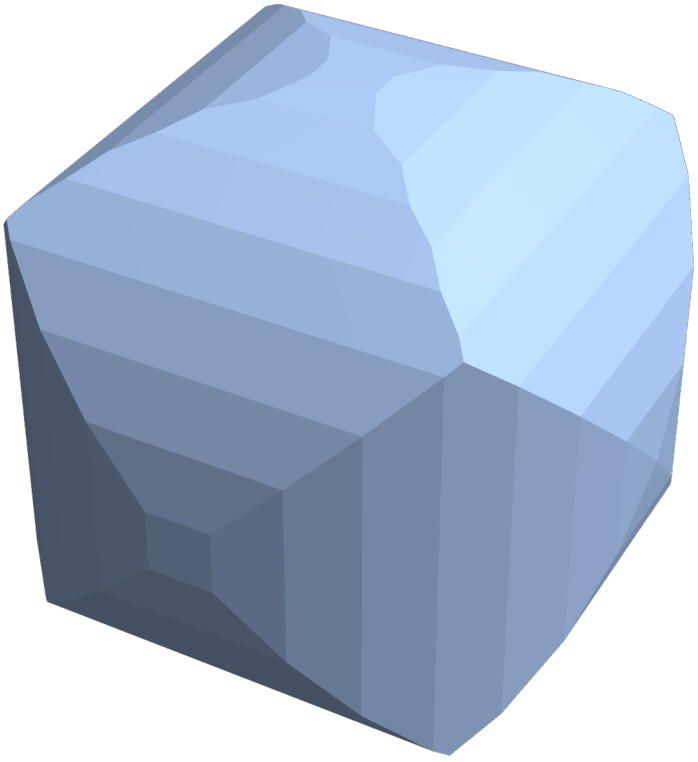
In[ ]:=
```
dr = DiscretizeRegion[region]
```
离散化区域

Out[ ]=



In[ ]:=
```
bdr = BoundaryDiscretizeRegion[region]
```
边界离散化区域

Out[ ]=



In[ ]:= **RegionCentroid[dr]**
区域形心

Out[ ]=

$$\{1.06655 \times 10^{-17}, -9.60229 \times 10^{-18}, -3.3953 \times 10^{-17}\}$$

In[ ]:= **RegionCentroid[bdr]**
区域形心

Out[ ]=

$$\{-1.44064 \times 10^{-17}, -6.0257 \times 10^{-17}, -3.00349 \times 10^{-17}\}$$

In[ ]:= **RegionMeasure[dr]**
区域度量

Out[ ]=

4.63499

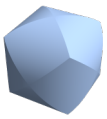
In[ ]:= **RegionMeasure[bdr]**
区域度量

Out[ ]=

4.63499

In[ ]:= **Volume[region]**
体积

Out[ ]=

Volume[]

In[ ]:= **Volume[dr]**
体积

Out[ ]=

4.63499

In[ ]:= **SurfaceArea[dr]**
曲面面积

Out[ ]=

13.9816

In[ ]:= **SurfaceArea[bdr]**
曲面面积

Out[ ]=

13.9816

In[ ]:= **SurfaceArea[region]**
曲面面积

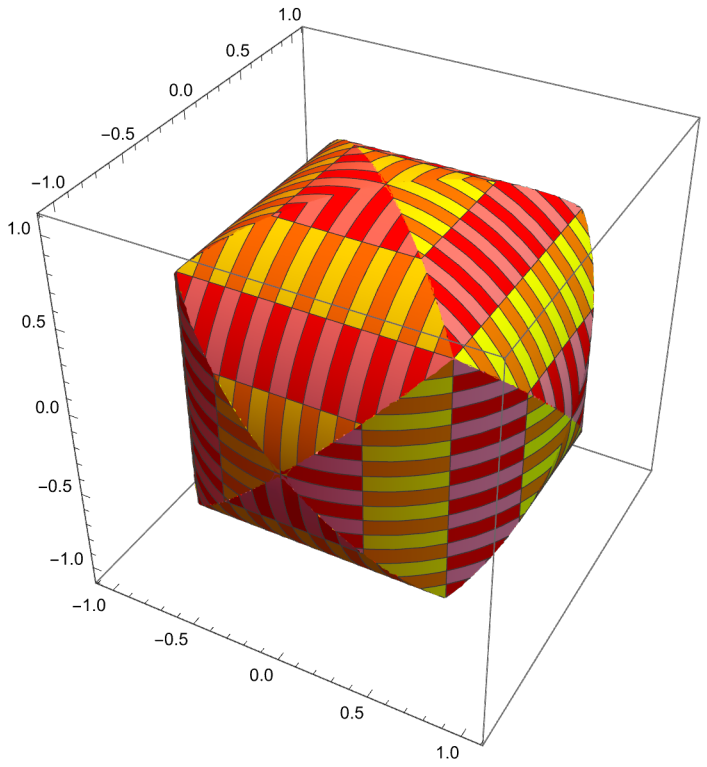
Out[ ]=

13.9912

着色效果

In[ ]:=
```
ParametricPlot3D[{{Cos[u], Sin[u], v}, {Cos[u], v, Sin[u]}, {v, Cos[u], Sin[u]}},
 {u, 0, 2 π}, {v, -1, 1}, PlotPoints → 50,
 RegionFunction → ({x, y, z} ↦ x^2 + y^2 ≤ 1 && x^2 + z^2 ≤ 1 && y^2 + z^2 ≤ 1),
 MeshShading → {{Red, Yellow}, {Pink, Orange}}]
```
绘制三维参数图 余弦 正弦 余弦 正弦 余弦 正弦 绘图点 区域函数 网格着色 红色 黄色 粉色 橙色

Out[ ]=



In[ ]:=
```
ParametricPlot3D[{{Cos[u], Sin[u], v}, {Cos[u], v, Sin[u]}, {v, Cos[u], Sin[u]}},
 绘制三维参数图          余弦   正弦   余弦   正弦   余弦   正弦
 {u, 0, 2 π}, {v, -1, 1}, PlotPoints → 50,
                          绘图点
 RegionFunction → ({x, y, z} ↦ x^2 + y^2 ≤ 1 && x^2 + z^2 ≤ 1 && y^2 + z^2 ≤ 1),
 区域函数
 ColorFunction → "TemperatureMap"]
 颜色函数
```

Out[ ]=