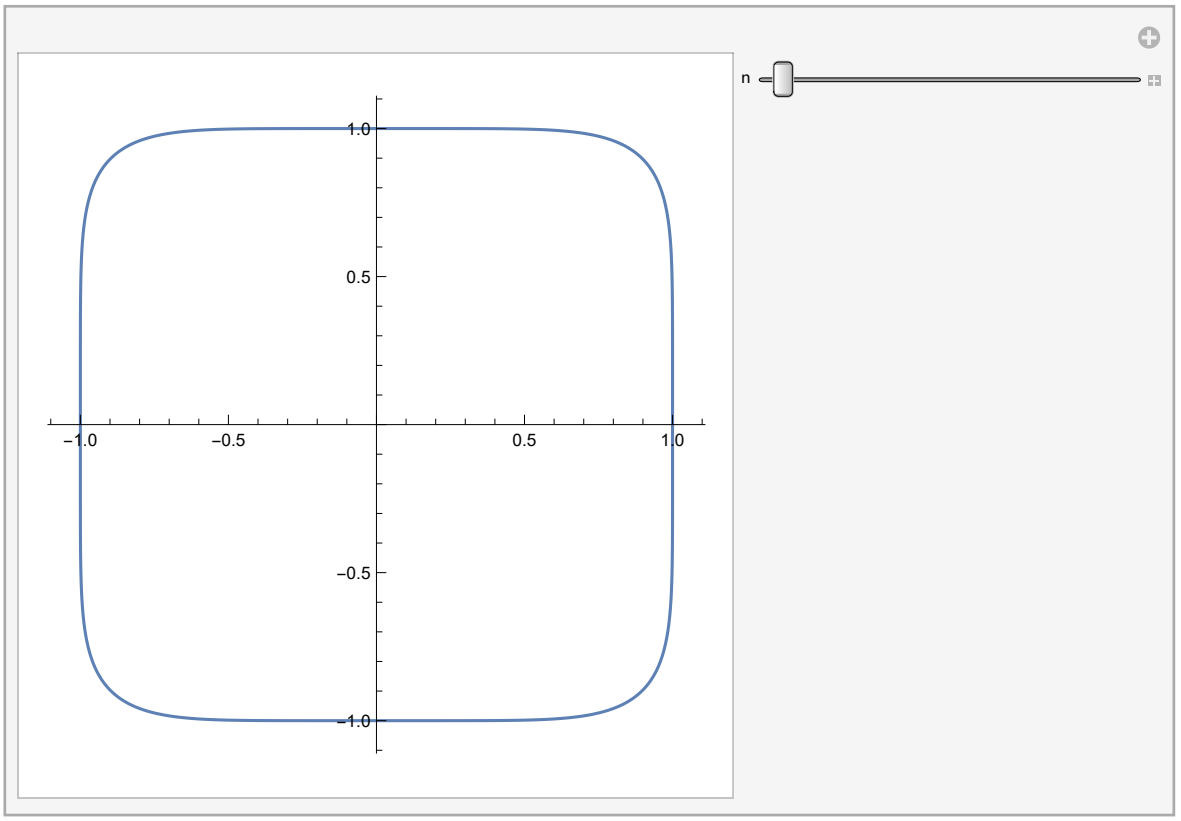
# 3 D 超椭圆

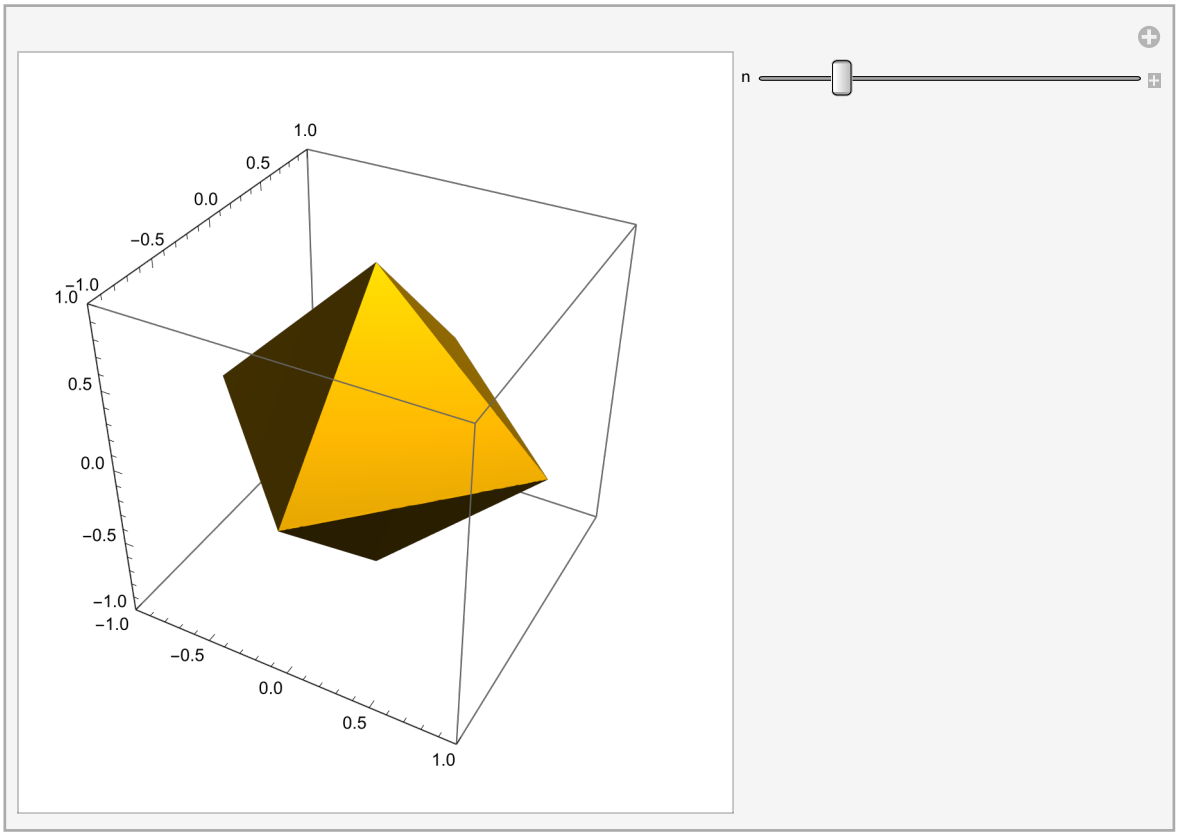
In[ ]:=
```
Manipulate[
  ParametricPlot[{Sign[#] Abs[#]^n & /@ {Cos[t], Sin[t]}}, {t, 0, 2 π}], {{n, 2}, 0.1, 10}]
```
交互式操作　绘制参数图　正负符号　余弦　正弦

Out[ ]=



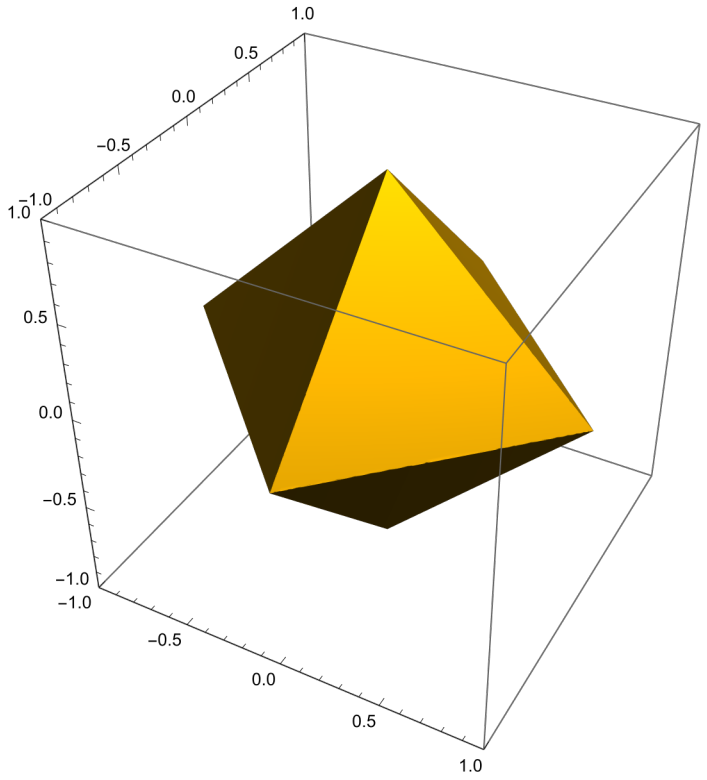
In[ ]:=
```
Manipulate[
  交互式操作
  ParametricPlot3D[{Sign[#] Abs[#]^n & /@ {Cos[u] Cos[v], Sin[u] Cos[v], Sin[v]}},
  绘制三维参数图  正负符号  余弦  余弦  正弦  余弦  正弦
  {u, 0, 2 π}, {v, 0, 2 π}, PlotRange → 1, Mesh → None, PlotPoints → 55,
                            绘制范围  网格  无  绘图点
  PlotStyle → {MaterialShading["Gold"]}, Lighting → "ThreePoint"], {{n, 2}, 0.1, 10}]
  绘图样式  材质效果图  光照
```

Out[ ]=



In[ ]:=
```
ParametricPlot3D[{Sign[#] Abs[#]^2 & /@ {Cos[u] Cos[v], Sin[u] Cos[v], Sin[v]}},
 绘制三维参数图  正负符号  余弦  余弦  正弦  余弦  正弦
 {u, 0, 2 π}, {v, 0, 2 π}, PlotRange → 1, Mesh → None, PlotPoints → 55,
                           绘制范围  网格  无  绘图点
 PlotStyle → {MaterialShading["Gold"]}, Lighting → "ThreePoint"]
 绘图样式  材质效果图  光照
```

Out[ ]=



In[ ]:=
```
f[val_, n_] := Sign[val] Abs[val]^n;
```
正负符号

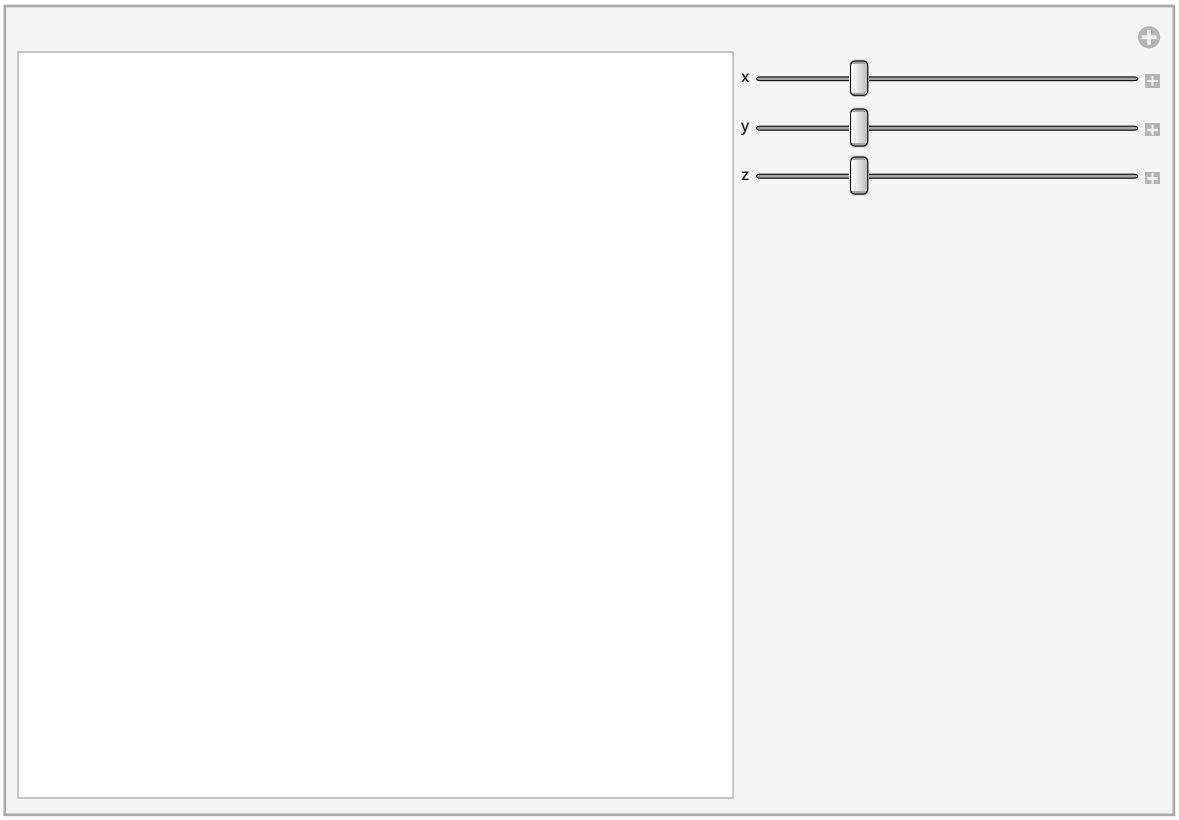
```
Manipulate[ParametricPlot3D[Thread[f[{Cos[u] Cos[v], Sin[u] Cos[v], Sin[v]},
```
交互式操作 绘制三维参数图 逐项作用 余弦 余弦 正弦 余弦 正弦

```
    {x, y, z}]], {u, 0, 2 π}, {v, 0, 2 π}, PlotRange → 1, Mesh → None, PlotPoints → 55,
```
绘制范围 网格 无 绘图点

```
  PlotStyle → {MaterialShading["Glazed"]}, Lighting → "ThreePoint", Boxed → False,
```
绘图样式 材质效果图 光照 边界框 假

```
  Axes → False], {{x, 2}, 0.1, 10}, {{y, 2}, 0.1, 10}, {{z, 2}, 0.1, 10}]
```
坐标轴 假

Out[ ]=




In[ ]:=
```
Thread[f[{Cos[u] Cos[v], Sin[u] Cos[v], Sin[v]}, {x, y, z}]]
```
逐项作用 余弦 余弦 正弦 余弦 正弦

Out[ ]=
$$\{\text{Abs}[\text{Cos}[u]\,\text{Cos}[v]]^x\,\text{Sign}[\text{Cos}[u]\,\text{Cos}[v]],\ \text{Abs}[\text{Cos}[v]\,\text{Sin}[u]]^y\,\text{Sign}[\text{Cos}[v]\,\text{Sin}[u]],\ \text{Abs}[\text{Sin}[v]]^z\,\text{Sign}[\text{Sin}[v]]\}$$

In[ ]:=
```
ParametricPlot3D[{Sign[#] Abs[#]^2 &/@{Cos[u] Cos[v], Sin[u] Cos[v], Sin[v]}},
 {u, 0, 2π}, {v, 0, 2π}, PlotRange → 1, Mesh → None,
 PlotPoints → 99, PlotStyle → {MaterialShading["Gold"]},
 Lighting → "ThreePoint", Boxed → False, Axes → False]
```
绘制三维参数图 正负符号 绝对值 余弦 余弦 正弦 余弦 正弦
绘制范围 网格 无
绘图点 绘图样式 材质效果图
光照 边界框 假 坐标轴 假

Out[ ]=