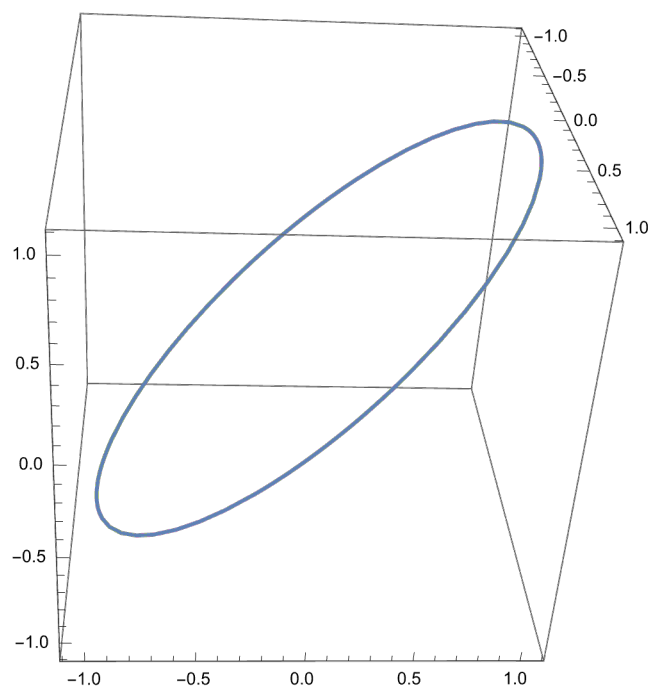


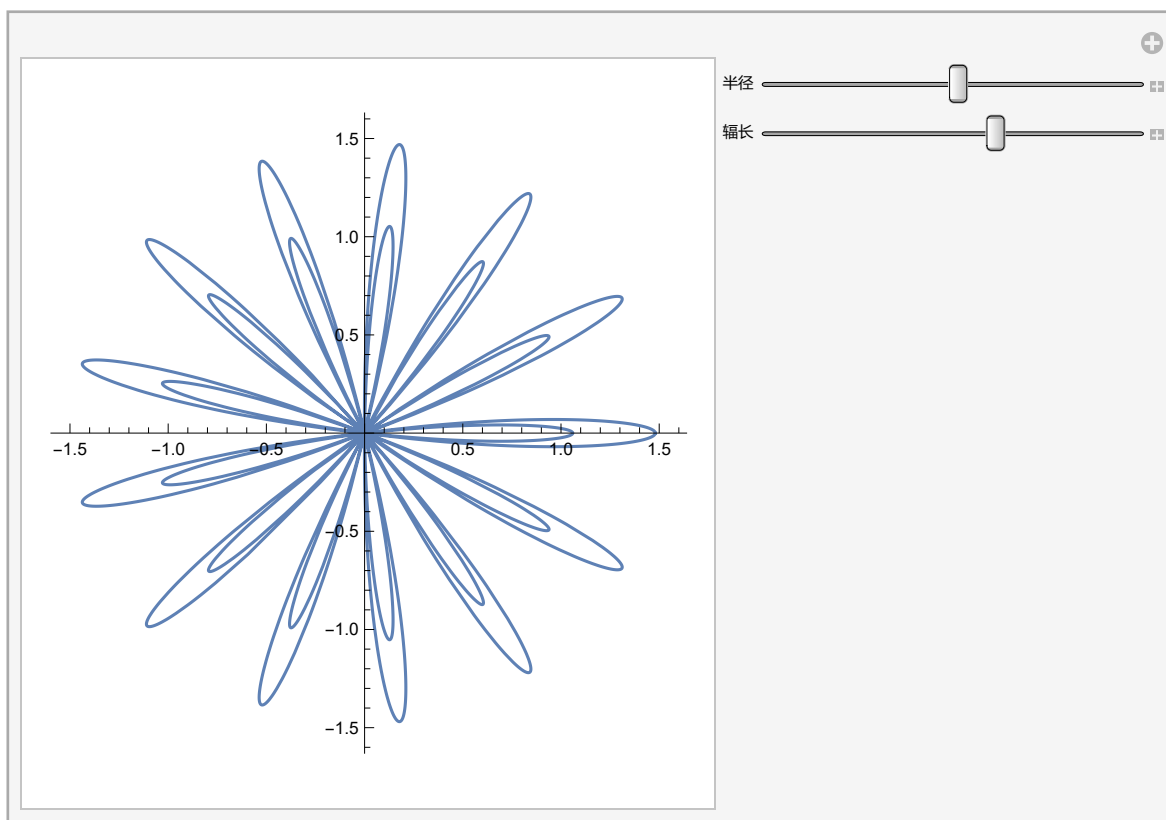
In[]:= **ParametricPlot3D[{Cos[v], Sin[v], Sin[v]}, {v, 0, 2 π }, RotationAction \rightarrow "Clip"]**
[绘制三维参数图](#) [余弦](#) [正弦](#) [正弦](#) [旋转操作](#) [剪切](#)

Out[]:=



`In[]:= Manipulate[ParametricPlot[ReIm[Eiθ (r + A Cos[13 θ])]], {θ, 0, 2 π}],`
[交互式操作](#) [绘制参数图](#) [实部虚部列表](#) [余弦](#)
`{ {r, 2, "半径"}, -5, 5}, { {A, 1, "辐长"}, -5, 5}]`

`Out[]:=`

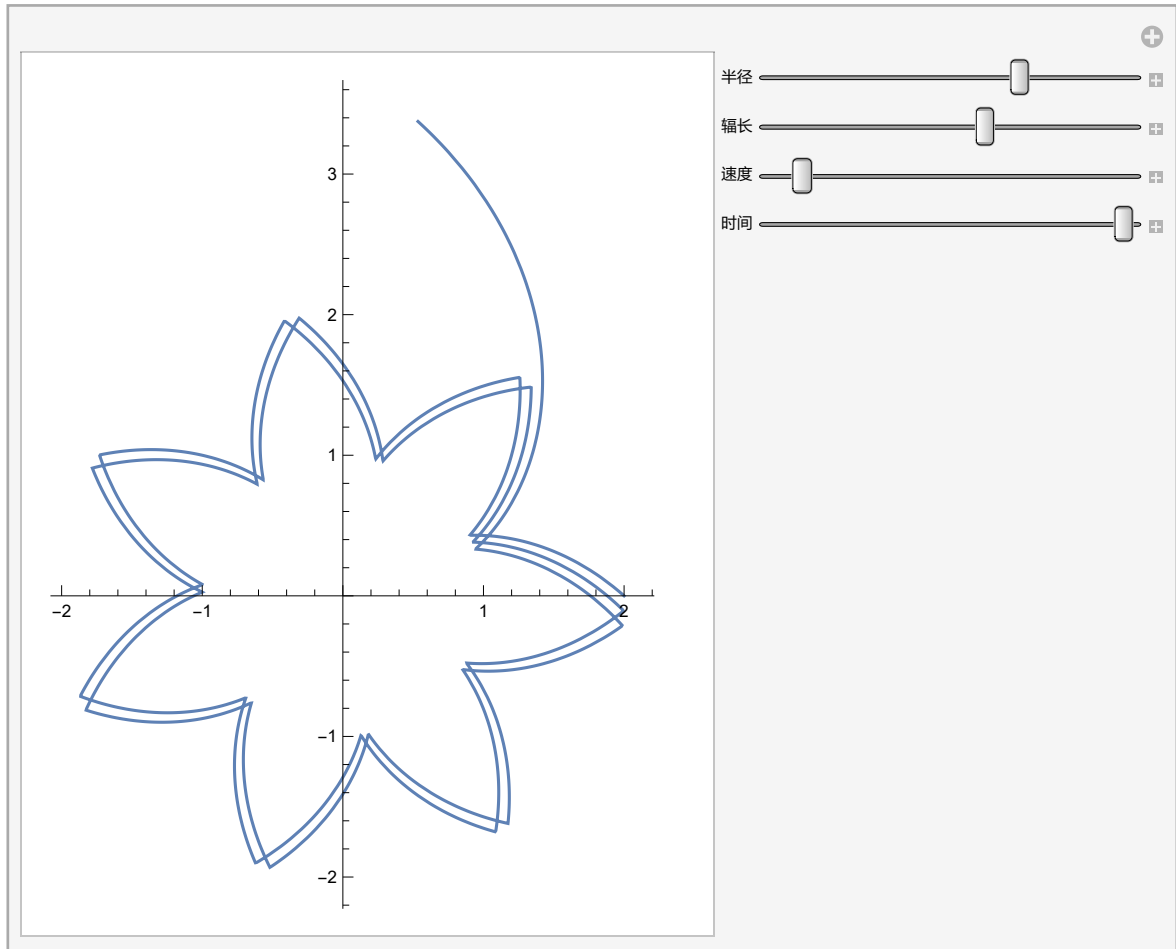


```

In[ ]:= Manipulate[ParametricPlot[ReIm[Eiθk (r + A Nest[Abs[#] - 1 &, θ - 15, 15])], {θ, 0, t}],
  |交互式操作 |绘制参数图 |实部虚部列表 |嵌套 |绝对值
  {{r, 2, "半径"}, -5, 5}, {{A, 1, "辐长"}, -5, 5},
  {{k, 1, "速度"}, 0.1, 5}, {{t, 2 π, "时间"}, 0.1, 10 π}]

```

Out[]:=

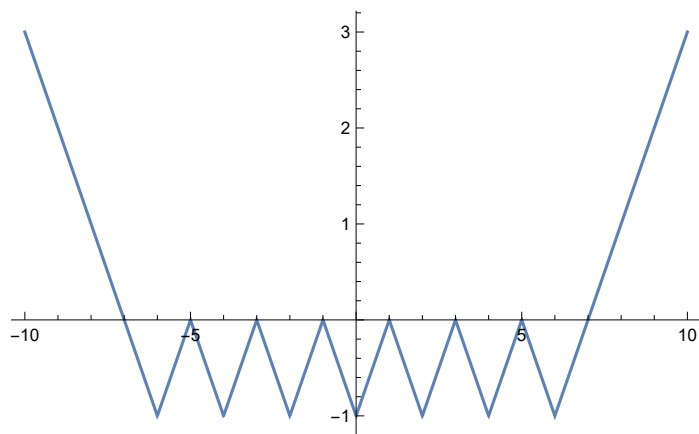


```

In[ ]:= Plot[Nest[Abs[#] - 1 &, x, 7], {x, -10, 10}]
  |绘图 |嵌套 |绝对值

```

Out[]:=



螺旋的切线，法线与副法线

```

In[ ]:= {r1, r2, r3, k} = {2, 1, 0.5, 5};
f[u_] := {Cos[u] (r1 + r2 Cos[k u]), Sin[u] (r1 + r2 Cos[k u]), r2 Sin[k u]};
b[t_] = Last@FrenetSerretSystem[f[t], t, "Cartesian"];
curve = ParametricPlot3D[f[u], {u, 0, 2 π}];
Manipulate[Show[curve,
ParametricPlot3D[f[t] + r3 Cos[u] b[t][[2]] + r3 Sin[u] b[t][[3]], {u, 0, 2 π}], Graphics3D[
{Thick, Purple, Arrow[{f[t], f[t] + b[t][[1]]}], Pink, Arrow[{f[t], f[t] + b[t][[2]]}],
Magenta, Arrow[{f[t], f[t] + b[t][[3]]}]}], {t, 1}, 0, 2 π]

```

Out[]:=



```

In[ ]:= b[2][[2]] // N

```

Out[]:=

```
{-0.524909, 0.629849, 0.572503}
```

```

In[ ]:= ParametricPlot3D[f[u] + Cos[v] b[u][[2]] + Sin[v] b[u][[3]],
{u, 0, 2 π}, {v, 0, 2 π}, RotationAction -> "Clip"]

```

Out[]:=

```
$Aborted
```

```

In[ ]:= {r1, r2, r3, k} = {2, 1, 0.5, 5};
x[t_] = Cos[t] (r1 + r2 Cos[k t]);
y[t_] = Sin[t] (r1 + r2 Cos[k t]);
z[t_] = r2 Sin[k t];
c[t_] = {x[t], y[t], z[t]};
T[t_] = Normalize[c'[t]];
MN[t_] = Normalize[c''[t]];
B[t_] = Cross[T[t], MN[t]];

```

```
In[ ]:= Last@FrenetSerretSystem[c[t], t] /. {t -> 2} // N
```

最... 弗莱纳系统 数值运算

```
Out[ ]:=
```

```
{ {-0.426182, 0.387739, -0.81733},
```

```
{ -0.524909, 0.629849, 0.572503}, {0.736777, 0.673014, -0.0649023}}
```

```
In[ ]:= Cross@@#& ; 2] == #&[3] &[%175]
```

叉积

```
Out[ ]:=
```

```
True
```

```
In[ ]:= {T[t], MN[t], B[t]} /. {t -> 2} // N
```

数值运算

```
Out[ ]:=
```

```
{ {-0.426182, 0.387739, -0.81733},
```

```
{ -0.535385, 0.639333, 0.55192}, {0.736547, 0.672804, -0.0648821}}
```

Manipulate[

交互式操作

```
Show[ParametricPlot[{x[t], y[t]}, {t, 0, 2 π}],
```

显示 绘制参数图

```
Graphics[{Arrow[{c[s], c[s] + {-Sin[0], Cos[0]}]}], {{s, 1}, 0, 2 π}]
```

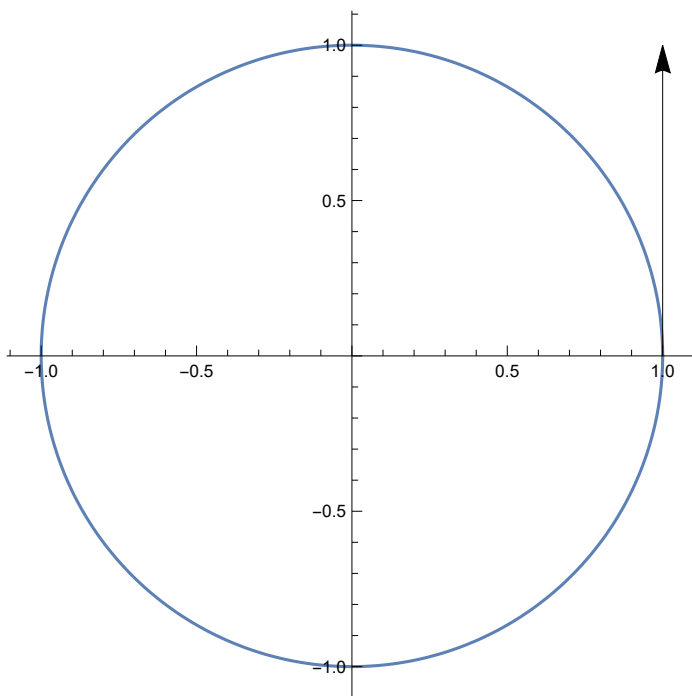
图形

箭头

正弦

余弦

```
Out[ ]:=
```



(对话) In[]:=

```
f[t_] := {Cos[t], Sin[t]};
```

余弦 正弦

```
b[t_] = Last@FrenetSerretSystem[f[t], t];
```

最... 弗莱纳系统

```
Manipulate[Graphics[{Circle[], Thick, Purple, Arrow[{f[t], f[t] + b[t][1]}],
```

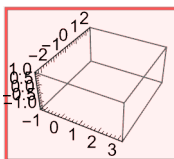
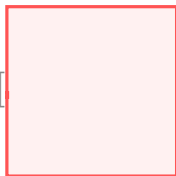
交互式操作 图形 圆 粗 紫色 箭头

```
Red, Arrow[{f[t], f[t] + b[t][2]}], PlotRange -> 2], {{t, 1}, 0, 2 π}]
```

红色 箭头 绘制范围



Show: 无法合并 Show[



] 中的图形对象.