In[ ]:=
```
f1[u_] = Cos[gamma * Cos[Pi * u / sigma1]]
```

Out[ ]=

$$\text{Cos}\left[\text{gamma Cos}\left[\frac{\pi\, u}{\text{sigma1}}\right]\right]$$

In[ ]:=
```
f2[u_] = Sin[gamma * Cos[Pi * u / sigma1]]
```

Out[ ]=

$$\text{Sin}\left[\text{gamma Cos}\left[\frac{\pi\, u}{\text{sigma1}}\right]\right]$$

In[ ]:=
```
gamma = Pi * Sqrt[2] / 2
```

Out[ ]=

$$\frac{\pi}{\sqrt{2}}$$

In[ ]:=
```
a = 1
```

Out[ ]=

```
1
```

In[ ]:=
```
sigma1 = a / BesselJ[0, gamma]
```

Out[ ]=

$$\frac{1}{\text{BesselJ}\left[0,\ \frac{\pi}{\sqrt{2}}\right]}$$

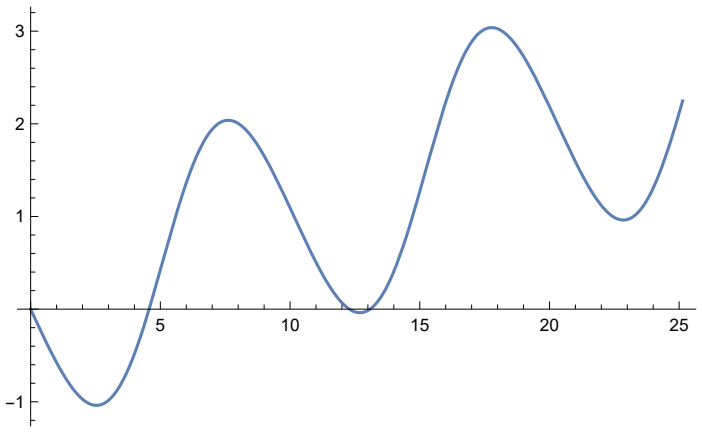
In[ ]:=
```
N[sigma1]
```

Out[ ]=

```
10.1549
```

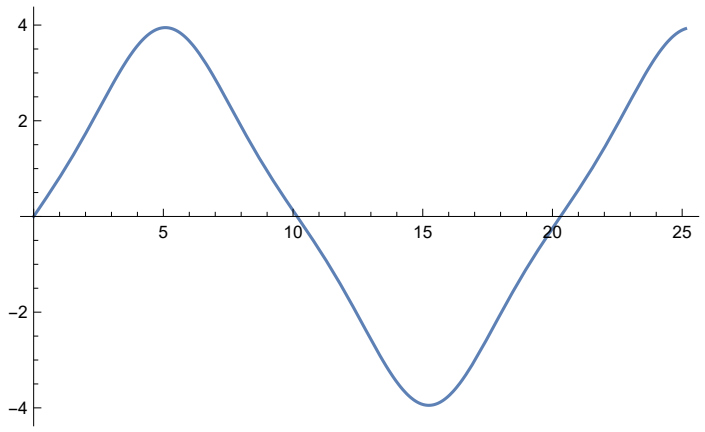
In[ ]:=
```
Plot[NIntegrate[f1[x], {x, 0, u}], {u, 0, 8 Pi}]
```

Out[ ]=



In[ ]:=
```
Plot[NIntegrate[f2[x], {x, 0, u}], {u, 0, 8 Pi}]
```

Out[ ]=



In[ ]:=
```
t = 0
```

Out[ ]=
```
0
```

In[ ]:=
```
0
```

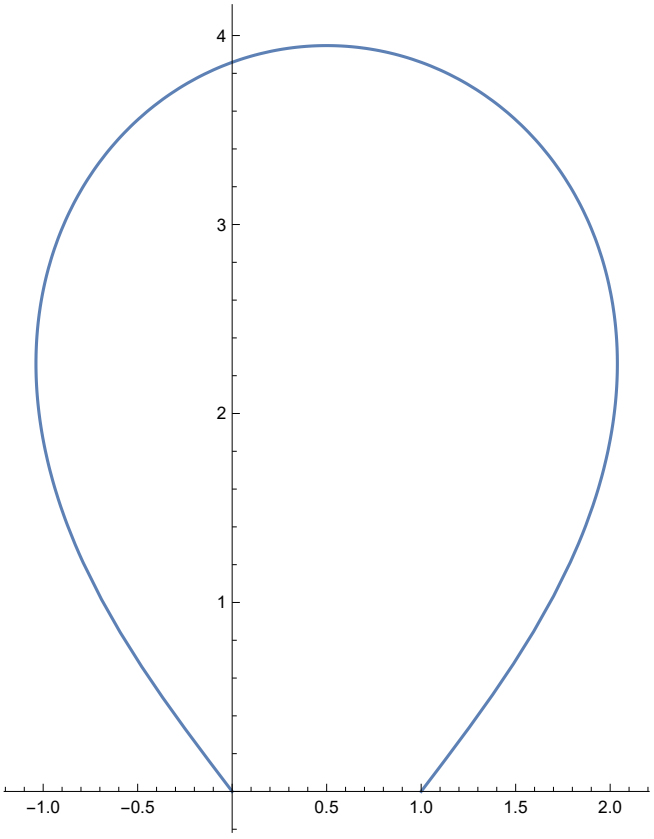
Out[ ]=
```
0
```

In[ ]:=
```
c = 1
```

Out[ ]=
```
1
```

In[ ]:=
```
ParametricPlot[
 {1 / 2 (NIntegrate[f1[x], {x, 0, c * t + sigma}] - NIntegrate[f1[x], {x, 0, c * t - sigma}]),
  1 / 2 (NIntegrate[f2[x], {x, 0, c * t + sigma}] -
     NIntegrate[f2[x], {x, 0, c * t - sigma}])}, {sigma, 0, sigma1}]
```

Out[ ]=



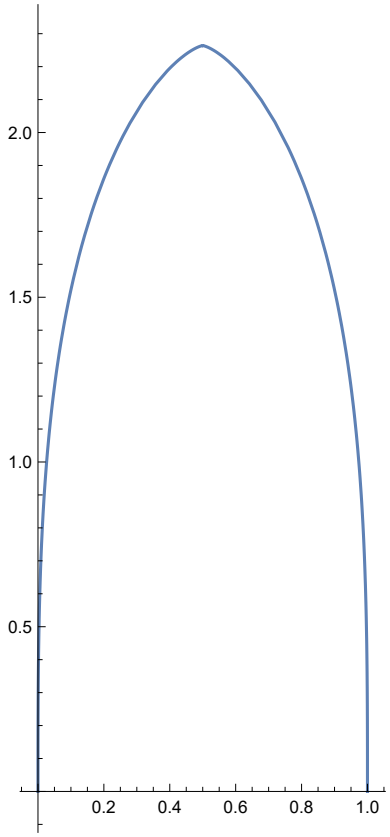
In[ ]:=
```
t = sigma1 / 4
```

Out[ ]=

$$\frac{1}{4\,\text{BesselJ}\left[0,\ \frac{\pi}{\sqrt{2}}\right]}$$

In[ ]:=
```
ParametricPlot[
 {1 / 2 (NIntegrate[f1[x], {x, 0, c * t + sigma}] - NIntegrate[f1[x], {x, 0, c * t - sigma}]),
  1 / 2 (NIntegrate[f2[x], {x, 0, c * t + sigma}] -
     NIntegrate[f2[x], {x, 0, c * t - sigma}])}, {sigma, 0, sigma1}]
```

Out[ ]=



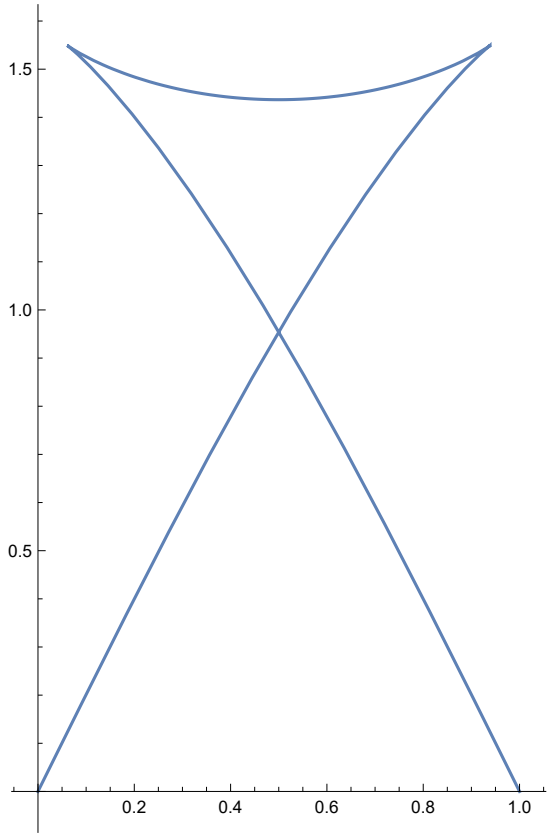
In[ ]:=
```
t = sigma1 / 3
```

Out[ ]=

$$\frac{1}{3\,\text{BesselJ}\left[0,\ \frac{\pi}{\sqrt{2}}\right]}$$

In[ ]:=
```
ParametricPlot[
 {1 / 2 (NIntegrate[f1[x], {x, 0, c * t + sigma}] - NIntegrate[f1[x], {x, 0, c * t - sigma}]),
  1 / 2 (NIntegrate[f2[x], {x, 0, c * t + sigma}] -
     NIntegrate[f2[x], {x, 0, c * t - sigma}])}, {sigma, 0, sigma1}]
```

Out[ ]=



In[ ]:=
```
Animate[ParametricPlot[{1 / 2 (NIntegrate[f1[x], {x, 0, c * t + sigma}] -
       NIntegrate[f1[x], {x, 0, c * t - sigma}]), 1 / 2
     (NIntegrate[f2[x], {x, 0, c * t + sigma}] - NIntegrate[f2[x], {x, 0, c * t - sigma}])},
  {sigma, 0, sigma1}], {t, 0, sigma1}, AnimationRunning → False]
```

Out[ ]=