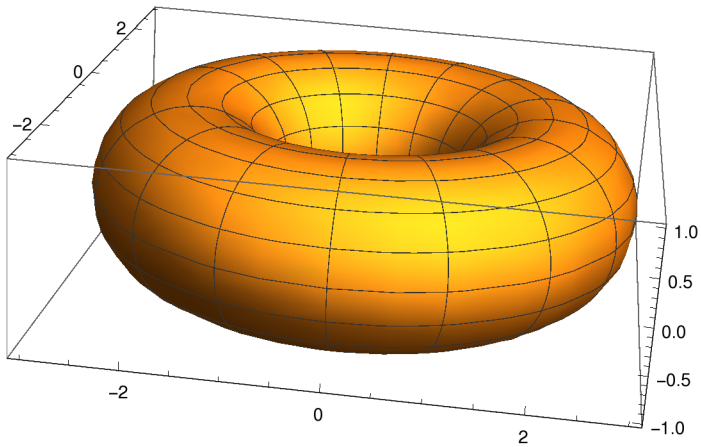


```
f[u_, v_] = {(2 + Cos[u]) Cos[v], (2 + Cos[u]) Sin[v], Sin[u]}
{(2 + Cos[u]) Cos[v], (2 + Cos[u]) Sin[v], Sin[u]}
```

```
ParametricPlot3D[f[u, v], {u, -Pi, Pi}, {v, -Pi, Pi}]
```



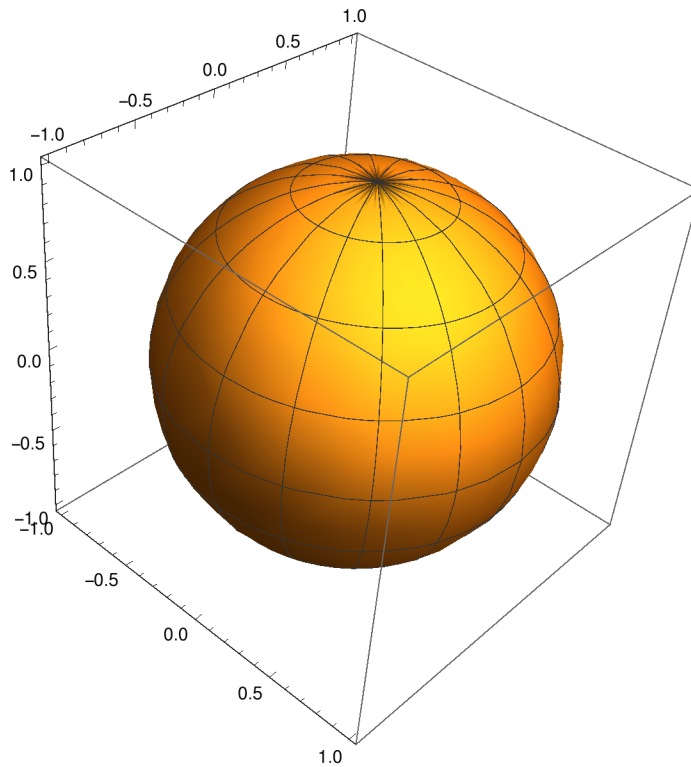
```
Cross[D[f[u, v], u], D[f[u, v], v]]
```

```
{-2 Cos[u] Cos[v] - Cos[u]^2 Cos[v], -2 Cos[u] Sin[v] - Cos[u]^2 Sin[v],
-2 Cos[v]^2 Sin[u] - Cos[u] Cos[v]^2 Sin[u] - 2 Sin[u] Sin[v]^2 - Cos[u] Sin[u] Sin[v]^2}
```

```
Simplify[%]
```

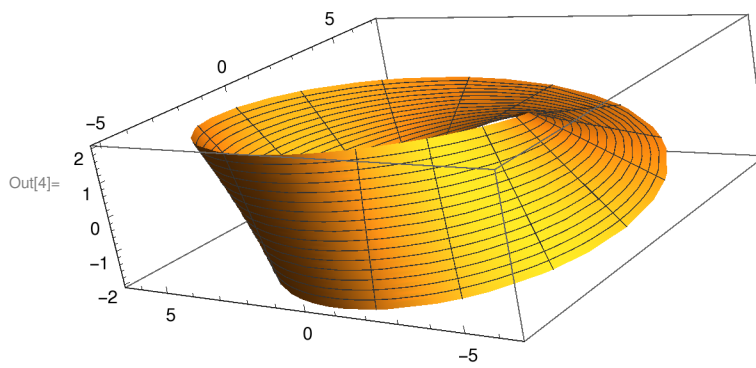
```
{-Cos[u] (2 + Cos[u]) Cos[v], -Cos[u] (2 + Cos[u]) Sin[v], -(2 + Cos[u]) Sin[u]}
```

```
ParametricPlot3D[%/Norm[%], {u, -Pi, Pi}, {v, -Pi, Pi}]
```



```
In[3]:= Moebius[R_][s_, t_] := {(R + s Cos[t / 2]) Cos[t], (R + s Cos[t / 2]) Sin[t], s Sin[t / 2]}
```

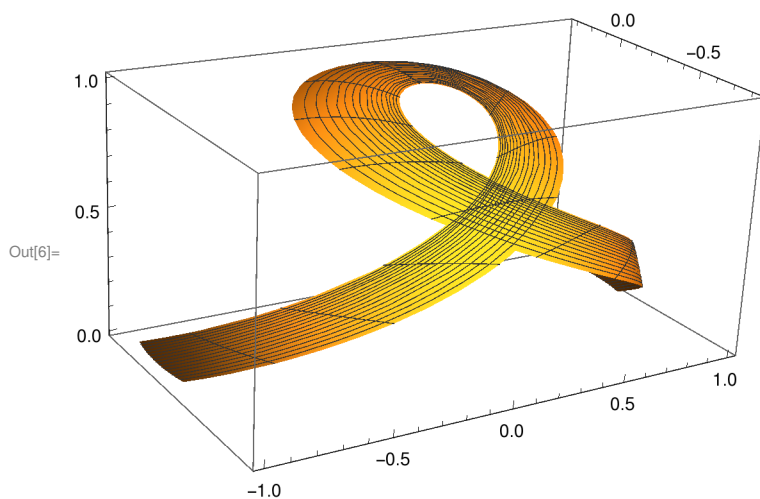
```
In[4]:= ParametricPlot3D[Moebius[5][s, t], {t, -Pi, Pi}, {s, -2, 2}]
```



```
In[5]:= Cross[D[Moebius[5][s, t], s], D[Moebius[5][s, t], t]]
```

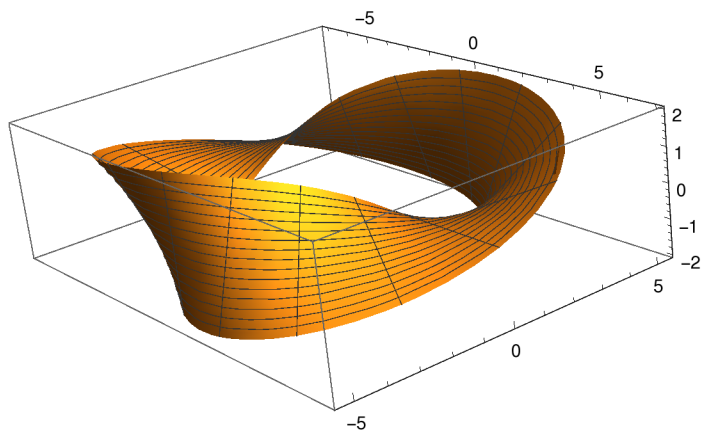
$$\text{Out[5]= } \left\{ \begin{aligned} & -5 \cos[t] \sin\left[\frac{t}{2}\right] - s \cos\left[\frac{t}{2}\right] \cos[t] \sin\left[\frac{t}{2}\right] + \frac{1}{2} s \cos\left[\frac{t}{2}\right]^2 \sin[t] + \frac{1}{2} s \sin\left[\frac{t}{2}\right]^2 \sin[t], \\ & -\frac{1}{2} s \cos\left[\frac{t}{2}\right]^2 \cos[t] - \frac{1}{2} s \cos[t] \sin\left[\frac{t}{2}\right]^2 - 5 \sin\left[\frac{t}{2}\right] \sin[t] - s \cos\left[\frac{t}{2}\right] \sin\left[\frac{t}{2}\right] \sin[t], \\ & 5 \cos\left[\frac{t}{2}\right] \cos[t]^2 + s \cos\left[\frac{t}{2}\right]^2 \cos[t]^2 + 5 \cos\left[\frac{t}{2}\right] \sin[t]^2 + s \cos\left[\frac{t}{2}\right]^2 \sin[t]^2 \end{aligned} \right\}$$

```
In[6]:= ParametricPlot3D[%/Norm[%], {t, -Pi, Pi}, {s, -2, 2}]
```



```
Moebius2[R_][s_, t_] := {(R + s Cos[t]) Cos[t], (R + s Cos[t]) Sin[t], s Sin[t]}
```

```
ParametricPlot3D[Moebius2[5][s, t], {t, -Pi, Pi}, {s, -2, 2}]
```



```
Cross[D[Moebius2[5][s, t], s], D[Moebius2[5][s, t], t]]  
{-5 Cos[t] Sin[t] + s Sin[t]^3, -s Cos[t]^3 - 5 Sin[t]^2 - 2 s Cos[t] Sin[t]^2,  
 5 Cos[t]^3 + s Cos[t]^4 + 5 Cos[t] Sin[t]^2 + s Cos[t]^2 Sin[t]^2}  
  
ParametricPlot3D[%23 / Norm[%23], {t, -Pi, Pi}, {s, -2, 2}]
```

