

```
> restart;
```

This is torsion for a circular cylinder

```
> with(plots):
```

```
Warning, the name changecoords has been redefined
```

```
> x:=(Rho,Theta,Z)->a*Rho*cos(Theta)-beta*a*Rho*sin(Theta)*Z;  
x := (Rho, Theta, Z) → a P cos(Θ) - β a P sin(Θ) Z
```

```
> y:=(Rho,Theta,Z)->a*Rho*sin(Theta)+beta*a*Rho*cos(Theta)*Z;  
y := (Rho, Theta, Z) → a P sin(Θ) + β a P cos(Θ) Z
```

```
> z:=(Rho,Theta,Z)->Z;
```

```
z := (Rho, Theta, Z) → Z
```

```
> y(1,3,1);
```

```
a sin(3) + β a cos(3)
```

```
>
```

```
> beta:=0.3;
```

```
β := 0.3
```

```
> beta;
```

```
0.3
```

```
>
```

```
> unassign('Theta');
```

```
> unassign('Rho');
```

```
> Rho, Theta;
```

```
P, Θ
```

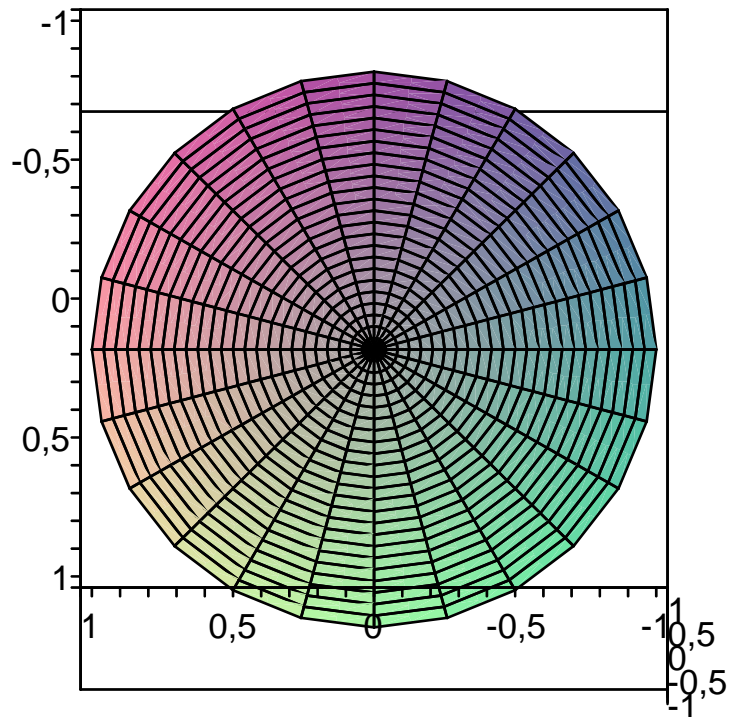
```
> Z:=0;
```

```
Z := 0
```

```
> a:=1;
```

```
a := 1
```

```
> s0:=plot3d([x(Rho,Theta,Z),y(Rho,Theta,Z),z(Rho,Theta,Z)],  
Rho=0..1,Theta=0..2*Pi,  
axes=box,orientation=[90,10],scaling=`CONSTRAINED`):s0;
```



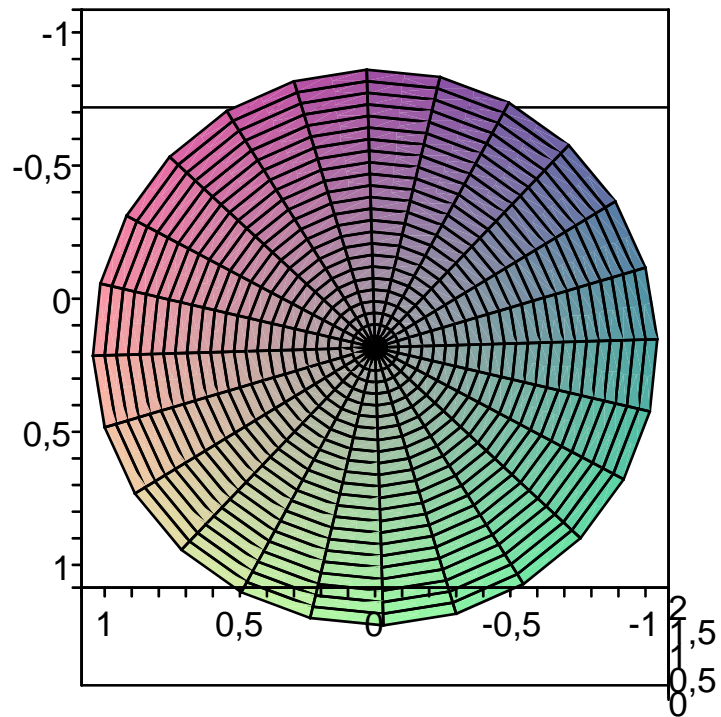
>

> z:=1;

Z:=1

>

```
> s1:=plot3d([x(Rho,Theta,Z),y(Rho,Theta,Z),z(Rho,Theta,Z)
],Rho=0..1,Theta=0..2*Pi,
axes=box,orientation=[90,10],scaling=`CONSTRAINED`):s1;
```



```
> unassign('Z');
```

```
> Z;
```

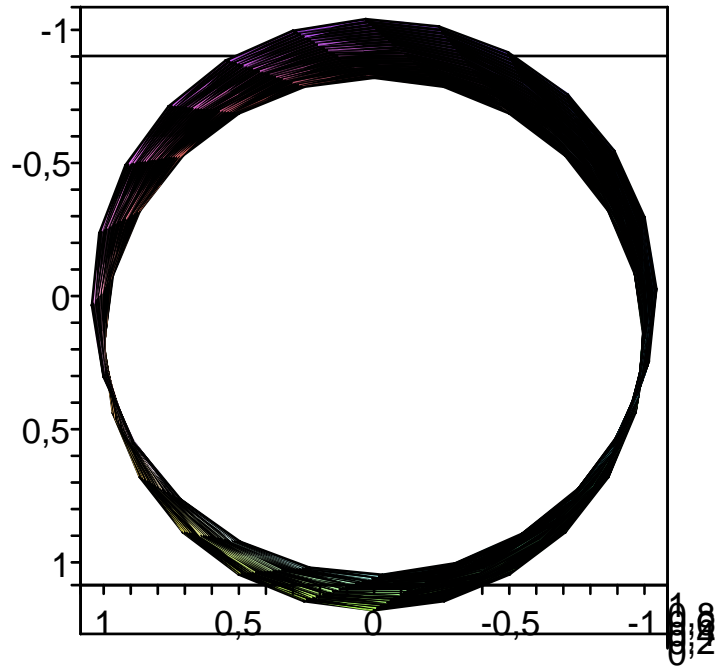
Z

```
> Rho:=1;
```

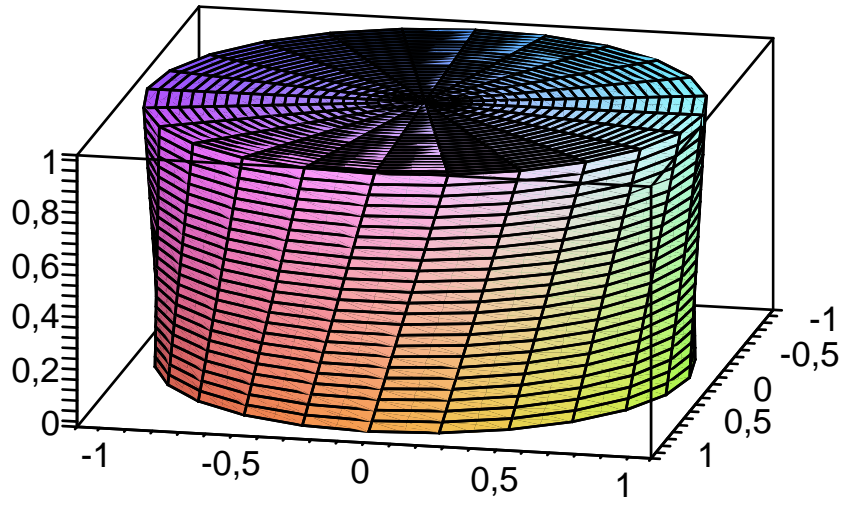
P:=1

```
>
```

```
> ss:=plot3d([x(Rho,Theta,Z),y(Rho,Theta,Z),z(Rho,Theta,Z)
],Theta=0..2*Pi,Z=0..1,
axes=box,orientation=[90,10],scaling=`CONSTRAINED`):ss;
```



```
> display(s0,s1,ss,axes=box,orientation=[12,75],scaling=constrained);
```



>
>