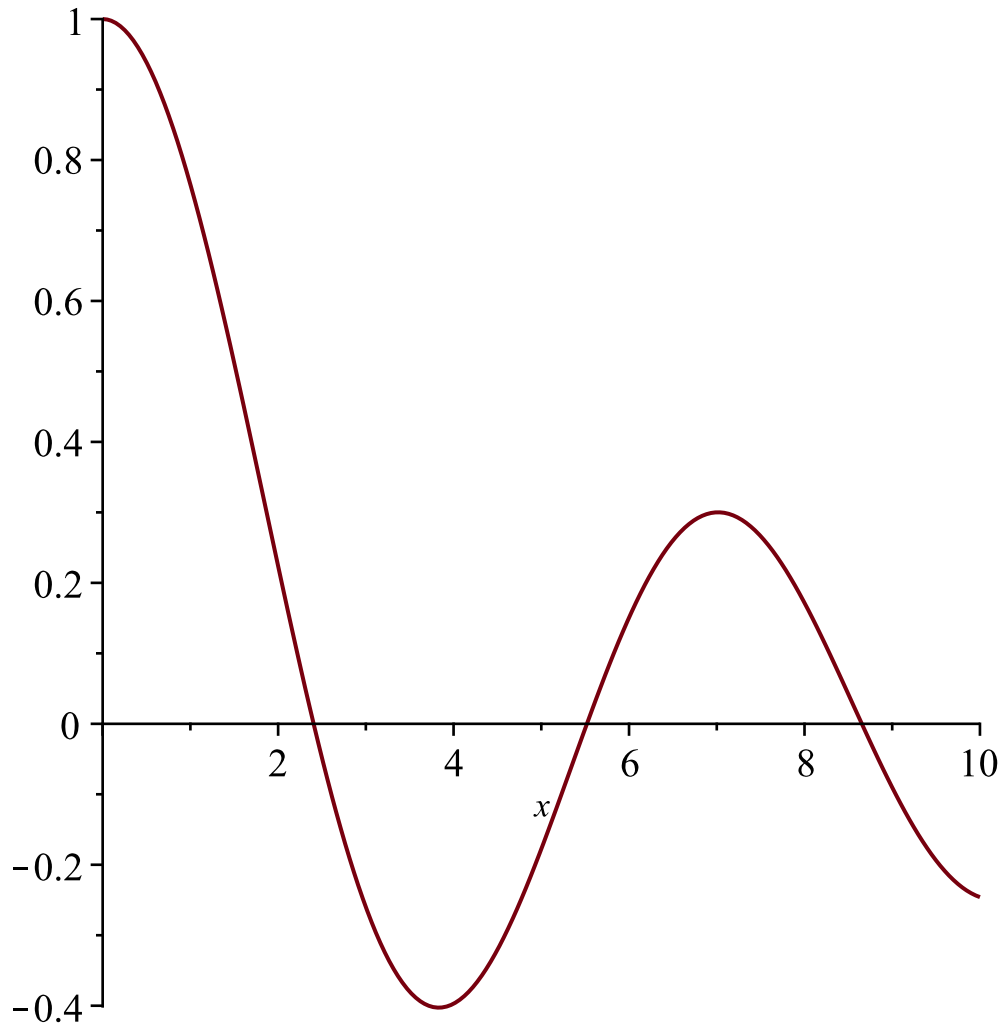
```
> plot(BesselJ(0,x),x=0..10);
```




```
> series(BesselJ(0,x),x=0,12);
```

$$1 - \frac{1}{4}x^2 + \frac{1}{64}x^4 - \frac{1}{2304}x^6 + \frac{1}{147456}x^8 - \frac{1}{14745600}x^{10} + O(x^{12}) \quad (1)$$

```
> fsolve(BesselJ(0,x)=0,x);
```

$$-2.404825558 \quad (2)$$

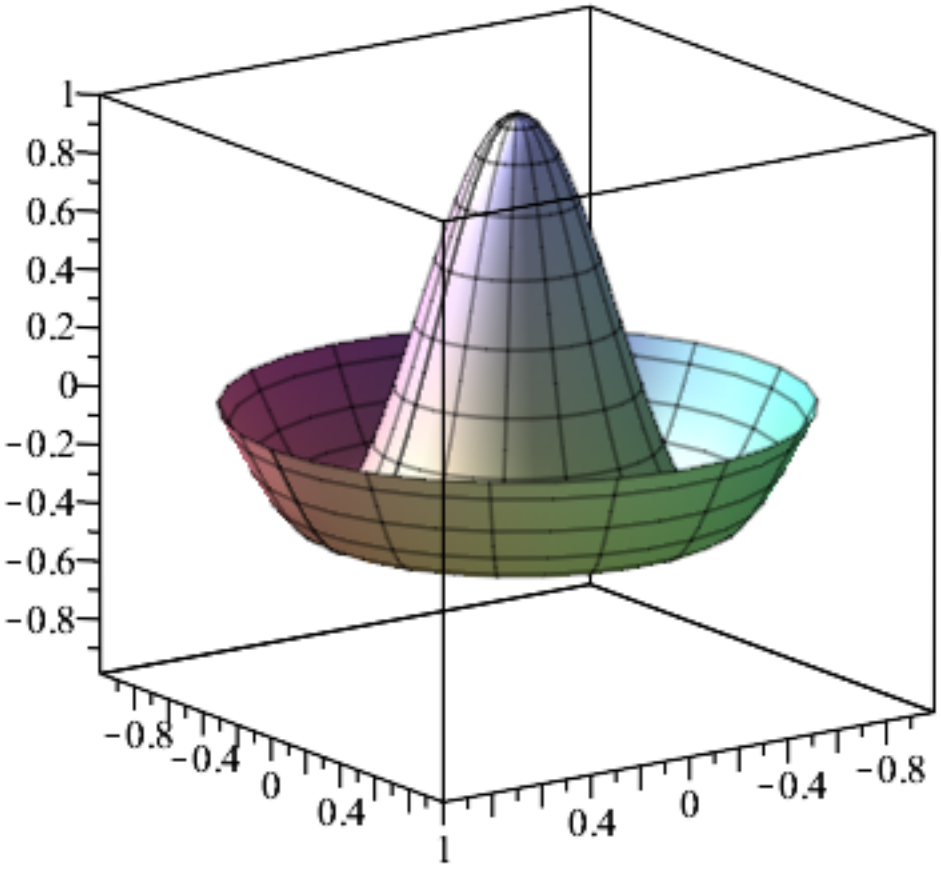
```
> R := fsolve(BesselJ(0,x)=0,x, 5..6);
```

$$R := 5.520078110 \quad (3)$$

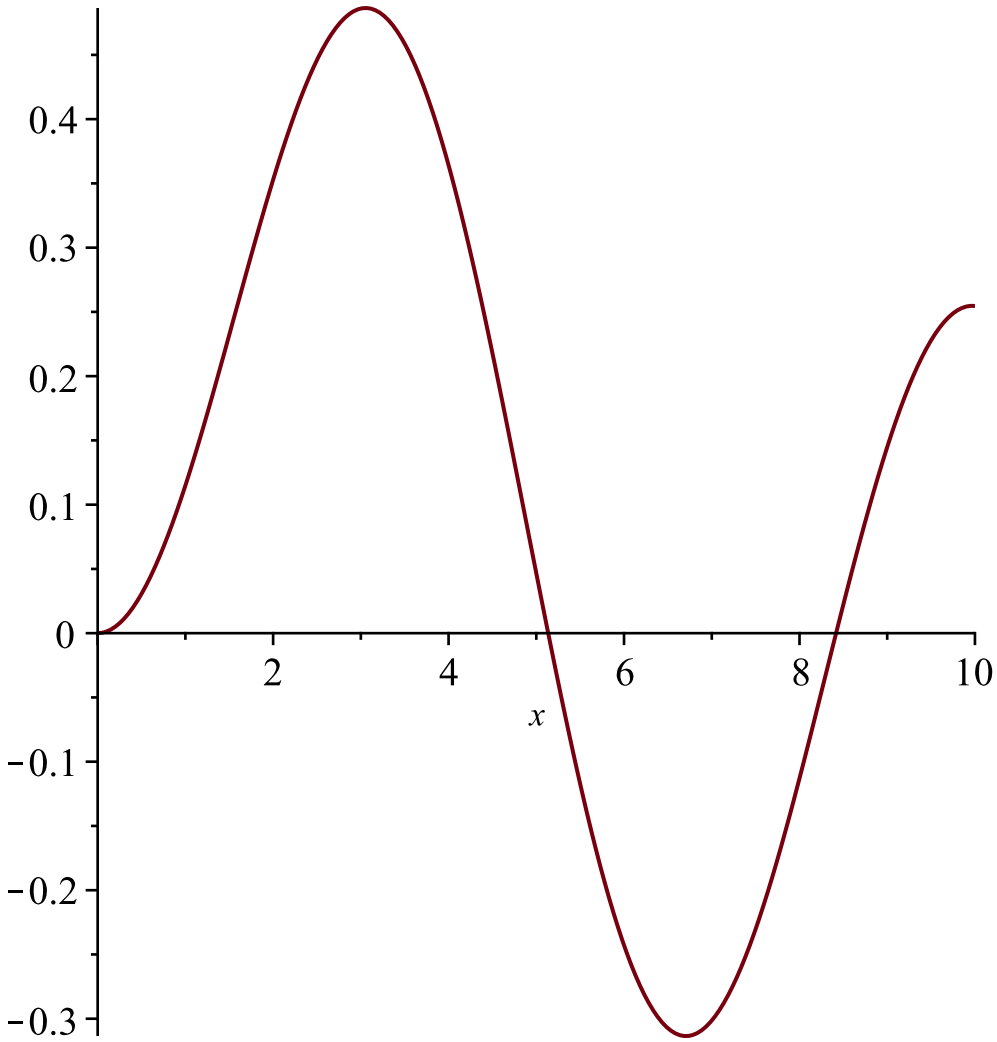
```
> z := (r,theta,t) -> BesselJ(0,R*r)*cos(t);
```

$$z := (r, \theta, t) \mapsto \mathrm{BesselJ}(0, R\,r)\cos(t) \quad (4)$$

```
> with(plots):
> animate3d([r*cos(theta),r*sin(theta),z(r,theta,t)],theta=0..2*Pi,
  r=0..1,t=0..2*Pi,grid=[30,30],frames=20);
```




```
> plot(BesselJ(2,x),x=0..10);
```



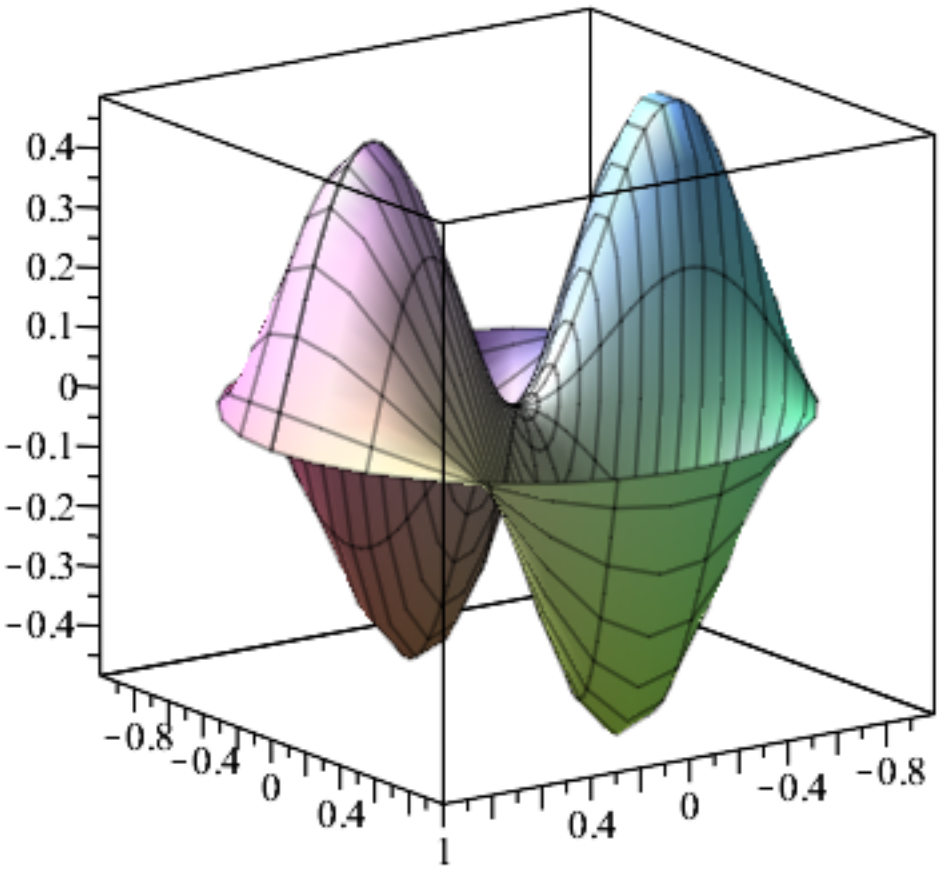

```
> R := fsolve(BesselJ(2,x)=0,x,4..6);
```

$$R := 5.135622302 \tag{5}$$

```
> z := (r,theta,t) -> BesselJ(2,R*r)*cos(2*theta)*cos(t);
```

$$z := (r, \theta, t) \mapsto \mathrm{BesselJ}(2, R\,r)\cos(2\,\theta)\cos(t) \tag{6}$$

```
> animate3d([r*cos(theta),r*sin(theta),z(r,theta,t)],theta=0..2*Pi,
  r=0..1,t=0..2*Pi,grid=[30,30],frames=20);
```


0.4
0.3
0.2
0.1
0
−0.1
−0.2
−0.3
−0.4
−0.8
−0.4
0
0.4
1
0.4
0
−0.4
−0.8