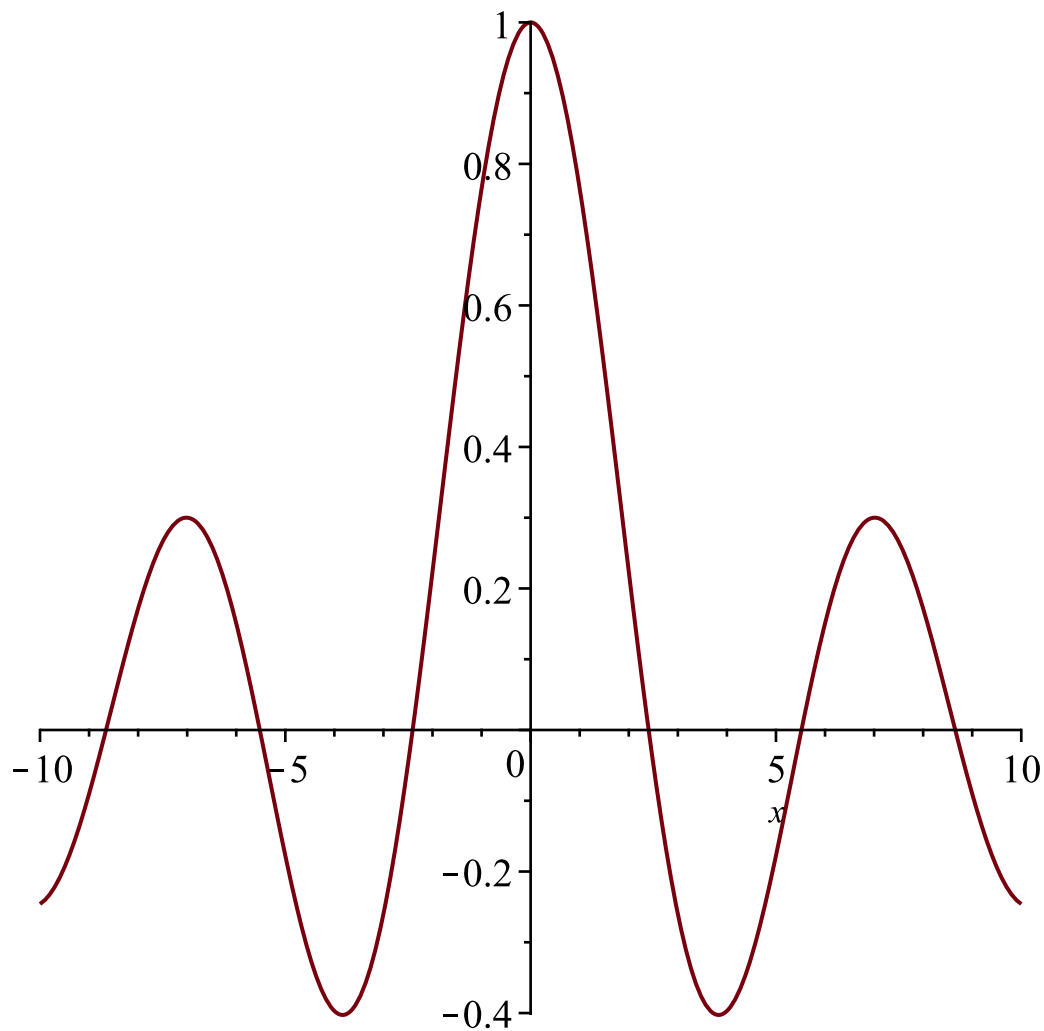


```
> with(plots):
> plot(BesselJ(0,x), x=-10..10);
```



```
> a := fsolve(BesselJ(0,x)=0,x,5..6);
5.520078110
```

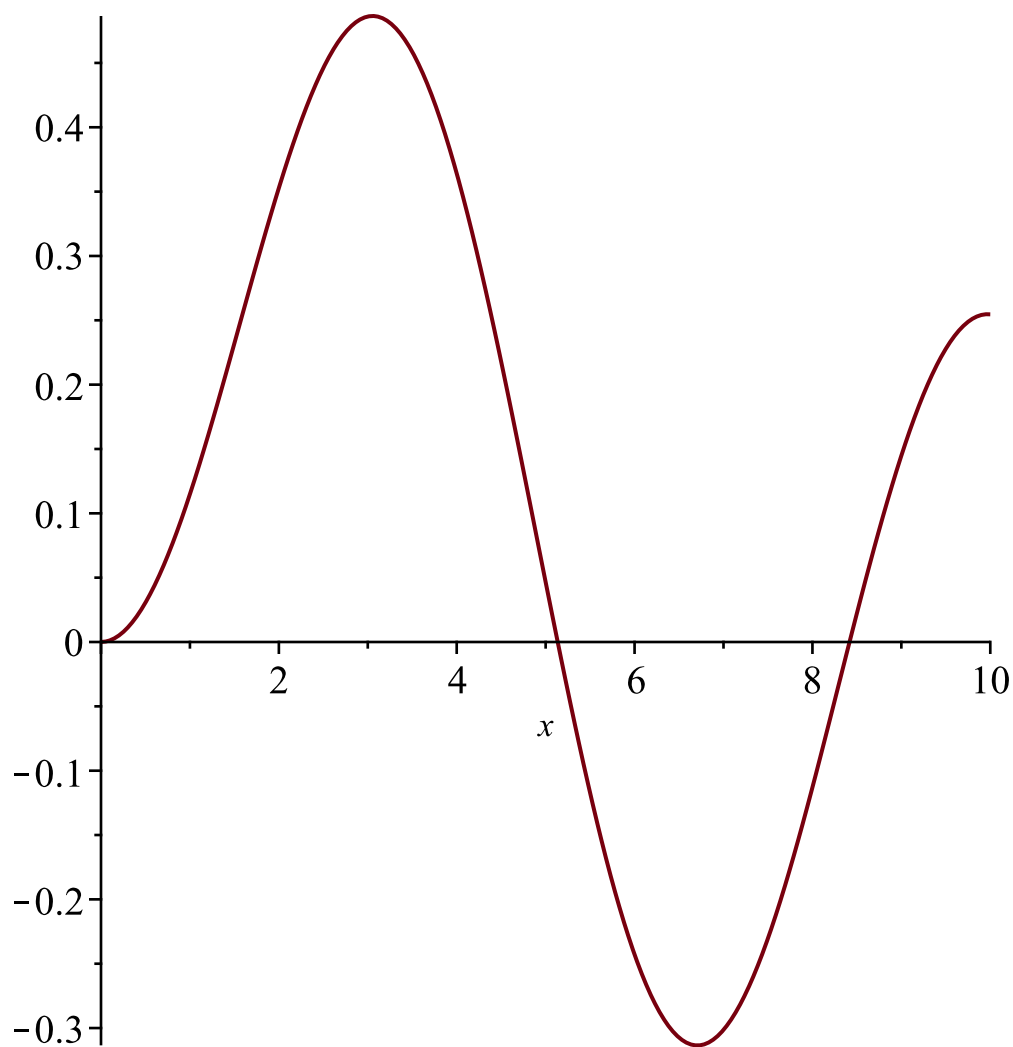
(1)

```
> taylor( BesselJ(0,x), x=0,16);
```

$$1 - \frac{1}{4}x^2 + \frac{1}{64}x^4 - \frac{1}{2304}x^6 + \frac{1}{147456}x^8 - \frac{1}{14745600}x^{10} + \frac{1}{2123366400}x^{12} - \frac{1}{416179814400}x^{14} + O(x^{16})$$

(2)

```
> animate(plot3d, [[r*cos(u), r*sin(u), BesselJ(0,a*r)*cos(t)], r=0..1,
u=0..2*Pi], t=0..2*Pi);
> plot(BesselJ(2,x), x=0..10);
```



```
> R := fsolve(BesselJ(2,x)=0,x,4..6);
5.135622302
```

(3)

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

(4)

```
> animate(plot3d, [[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);
```