```
> with(plots):
> dg:= x^2*diff(y(x),x$2)+2*x*diff(y(x),x)+(x^2-n(n+1))*y(x)=0;
```

$$dg := x^2 \left(\frac{d^2}{dx^2} y(x) \right) + 2x \left(\frac{d}{dx} y(x) \right) + \left(x^2 - n(n+1) \right) y(x) = 0 \quad (1)$$

```
> sol:=dsolve(dg);
```

$$sol := y(x) = \frac{\_C1 \, \mathrm{BesselJ}\left(\frac{1}{2} \sqrt{1 + 4n(n+1)}, x \right)}{\sqrt{x}} + \frac{\_C2 \, \mathrm{BesselY}\left(\frac{1}{2} \sqrt{1 + 4n(n+1)}, x \right)}{\sqrt{x}} \quad (2)$$

```
> y1:= op(2,op(1,rhs(sol)))*op(3,op(1,rhs(sol)));
```

$$y1 := \frac{\mathrm{BesselJ}\left(\frac{1}{2} \sqrt{1 + 4n(n+1)}, x \right)}{\sqrt{x}} \quad (3)$$

```
> y2:= op(2,op(2,rhs(sol)))*op(3,op(2,rhs(sol)));
```

$$y2 := \frac{\mathrm{BesselY}\left(\frac{1}{2} \sqrt{1 + 4n(n+1)}, x \right)}{\sqrt{x}} \quad (4)$$

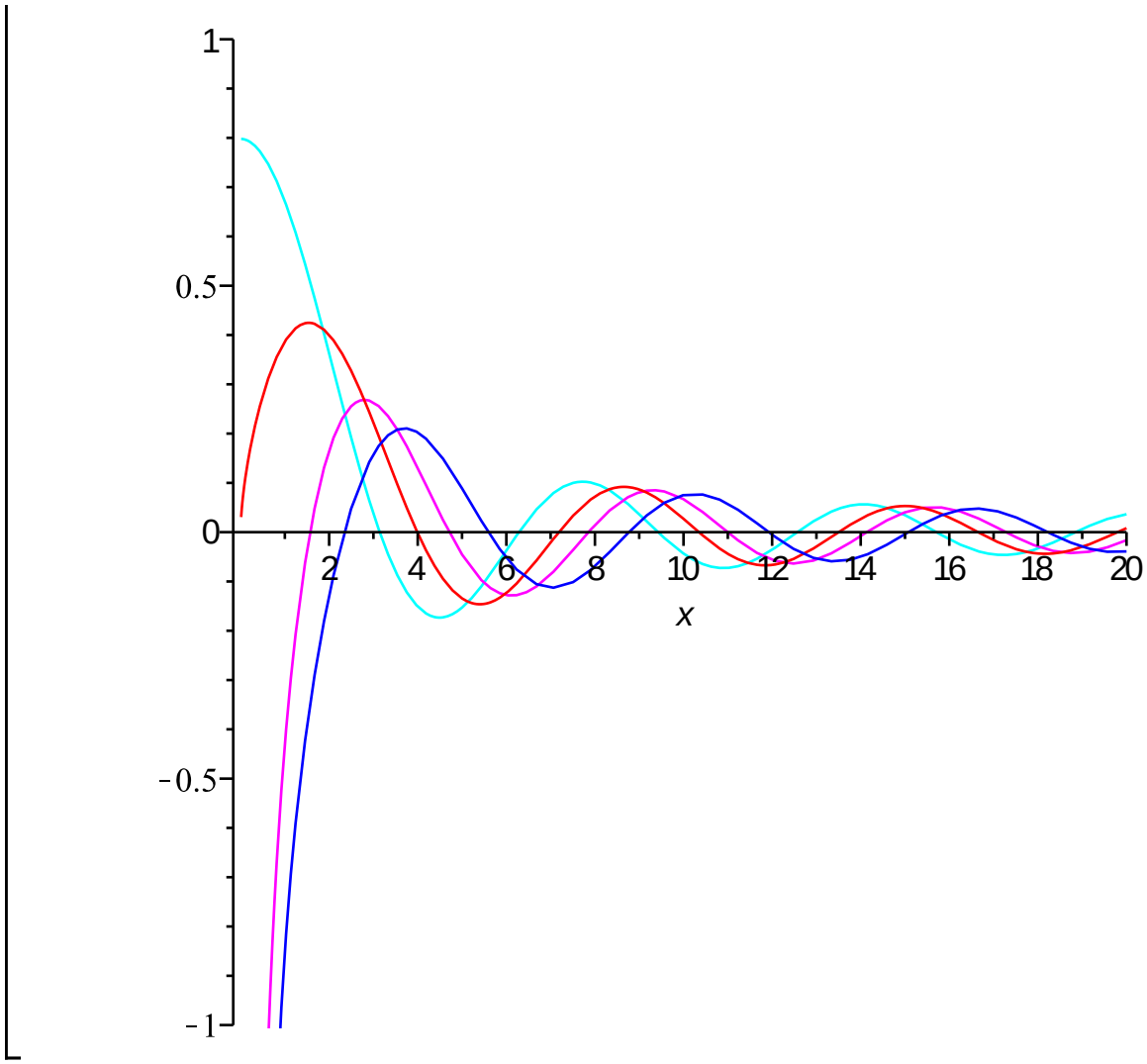
```
> p1:=plot(subs(n=0,[y1,y2]),x=0..20,view=-1..1,color=[cyan,
  magenta]);
```

$$p1 := PLOT(\ldots) \quad (5)$$

```
> p2:=plot(subs(n=1,[y1,y2]),x=0..20,view=-1..1,color=[red,blue])
  ;
```

$$p2 := PLOT(\ldots) \quad (6)$$

```
> display({p1,p2});
```


1
0.5
0
-0.5
-1
2
4
6
8
10
12
14
16
18
20
x