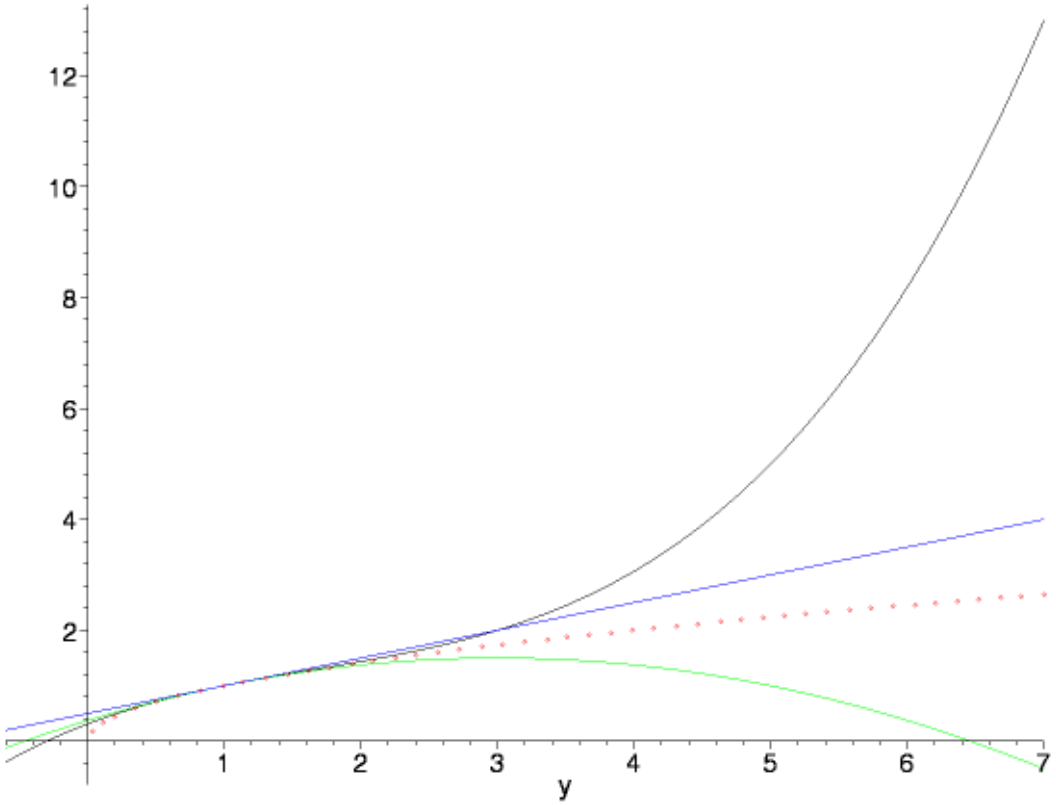
Polinomio de Taylor

(função raiz quadrada de x ---> gráfico em vermelho)

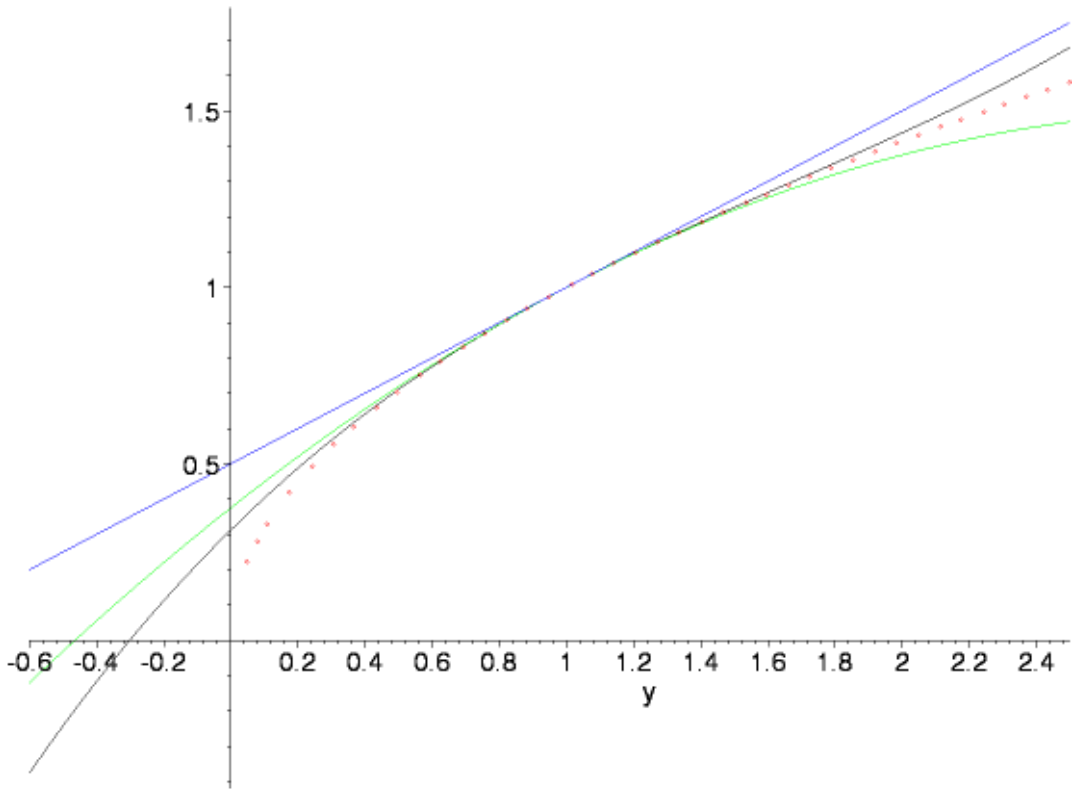
f(x)=sqrt(x), pol. de Taylor de ordem 1 (azul), pol. Taylor de ordem 2 (verde), pol. Taylor de ordem 3 (preto):

em torno de 1:

```
> plot([sqrt(y), y/2+1/2, -(y^2)/8+3*y/4+3/8, -(y^2)/8+3*y/4+3/8
  +3*((y-1)^3)/(8*6)], y=-0.6..7, color=[red,blue,green,black],
  style=[point,line,line,line]);
```




```
> plot([sqrt(y), y/2+1/2, -(y^2)/8+3*y/4+3/8, -(y^2)/8+3*y/4+3/8
  +3*((y-1)^3)/(8*6)], y=-0.6..2.5, color=[red,blue,green,black],
  style=[point,line,line,line]);
```



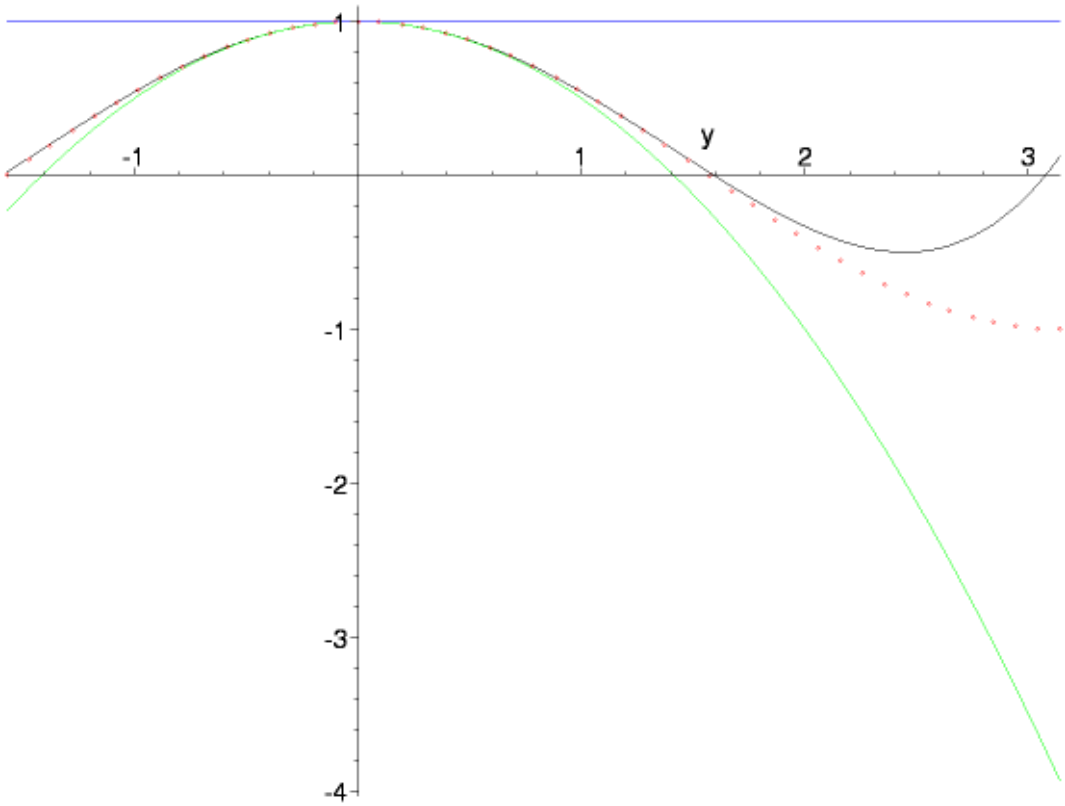

```
>
```

(função cosseno de x --> gráfico em vermelho)

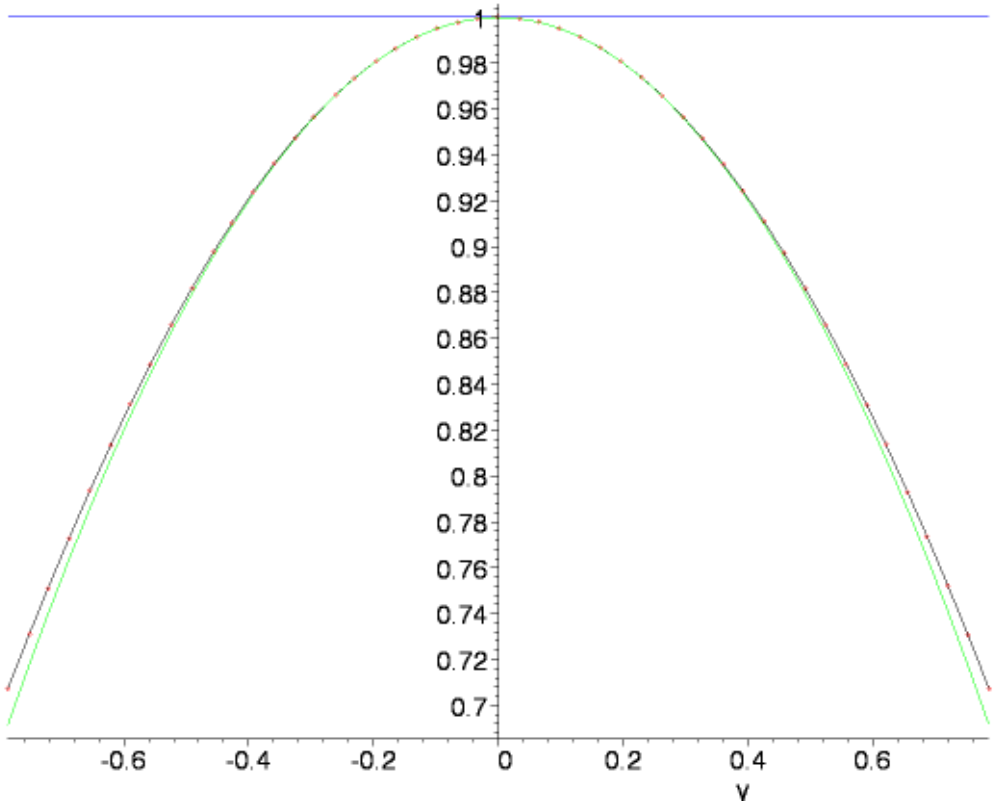
f(x)=cos(x), pol. de Taylor de ordem 1 (azul), pol. Taylor de ordem 2 (verde), pol. Taylor de ordem 4 (preto):

em torno de 0:

```
>
> plot([cos(y), 1, 1-(y^2)/2, 1-(y^2)/2+(y^4)/4!], y=-Pi/2..Pi,
  color=[red,blue,green,black], style=[point,line,line,line]);
```




```
> plot([cos(y), 1, 1-(y^2)/2, 1-(y^2)/2+(y^4)/4!], y=-Pi/4..Pi/4,
  color=[red,blue,green,black], style=[point,line,line,line]);
```

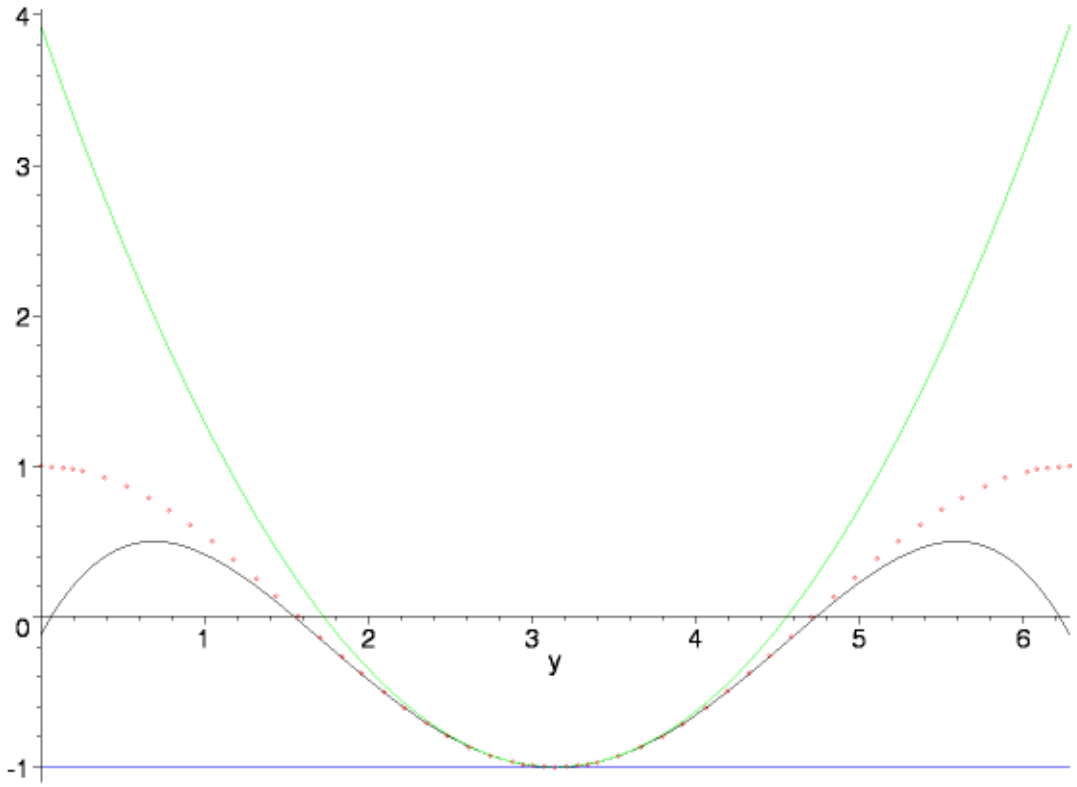



```
> f1:=diff(cos(x),x);
>
> f1a:= x->-sin(x);
```

```
> f1a(Pi);

> f2:=diff(f1,x);

> f2a:= x->-cos(x);
> f2a(Pi);

>
> f3:=diff(f2,x);

> f3a:= x->sin(x);
> f3a(Pi);

> f4:=diff(f3,x);

> f4a:= x->cos(x);

> f4a(Pi);

> f5:=diff(f4,x);
> f5a:= x->-sin(x);

> f5a(Pi/2);
```

em torno de Pi:

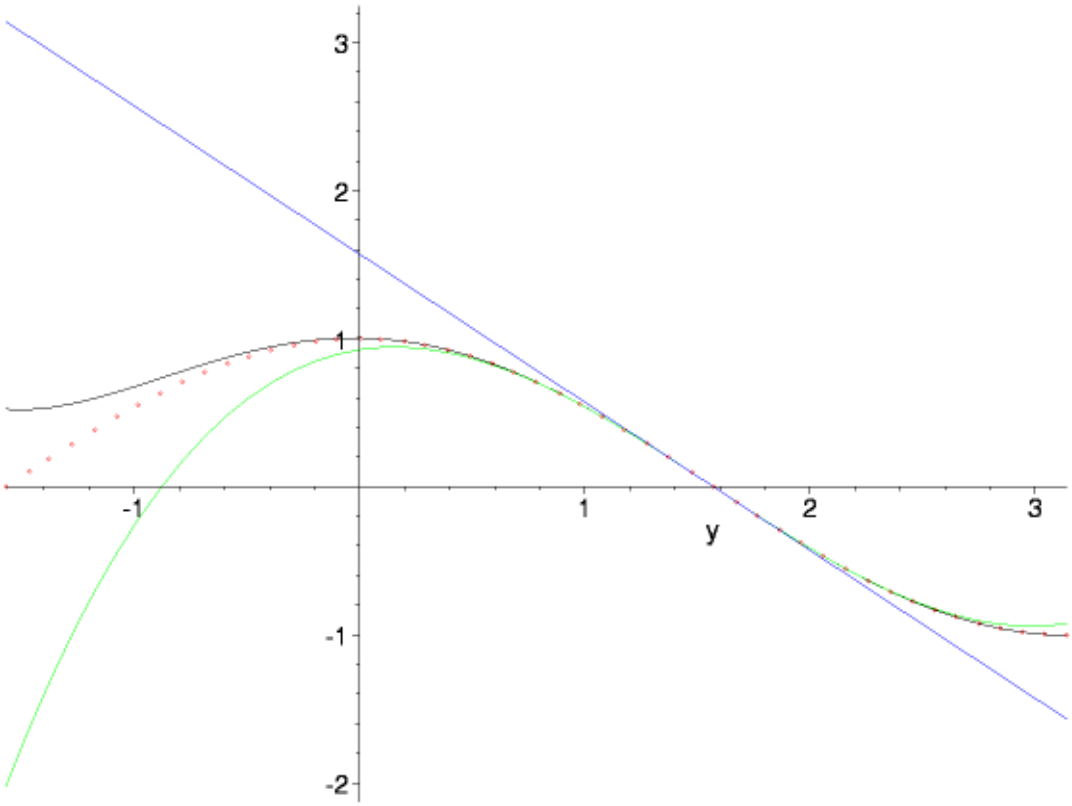
```
> plot([cos(y), cos(Pi)+f1a(Pi)*(y-Pi),
  cos(Pi)+f1a(Pi)*(y-Pi)+f2a(Pi)*(y-Pi)^2/2,
  cos(Pi)+f1a(Pi)*(y-Pi)+f2a(Pi)*(y-Pi)^2/2+f3a(Pi)*(y-Pi)^3/3!+f4
  a(Pi)*(y-Pi)^4/4!], y=0..2*Pi, color=[red,blue,green,black],
  style=[point,line,line,line]);
```



f(x)=cos(x), pol. de Taylor de ordem 1(azul), pol. Taylor de ordem 2(amarelo), pol. Taylor de ordem 3(verde), pol. Taylor de ordem 5(preto):

em torno de Pi/2:

```
> plot([cos(y), cos(Pi/2)+f1a(Pi/2)*(y-Pi/2),
  cos(Pi/2)+f1a(Pi/2)*(y-Pi/2)+f2a(Pi/2)*(y-Pi/2)^2/2,
  cos(Pi/2)+f1a(Pi/2)*(y-Pi/2)+f2a(Pi/2)*(y-Pi/2)^2/2+f3a(Pi/2)*(y
  -Pi/2)^3/3!,cos(Pi/2)+f1a(Pi/2)*(y-Pi/2)+f2a(Pi/2)*(y-Pi/2)^2/2+
  f3a(Pi/2)*(y-Pi/2)^3/3!+f4a(Pi/2)*(y-Pi/2)^4/4!+f5a(Pi/2)*(y-Pi/
  2)^5/5!], y=-Pi/2..Pi, color=[red,blue,yellow,green,black],
  style=[point,line,line,line,line]);
```




```
> plot([cos(y), cos(Pi/2)+f1a(Pi/2)*(y-Pi/2),
  cos(Pi/2)+f1a(Pi/2)*(y-Pi/2)+f2a(Pi/2)*(y-Pi/2)^2/2+f3a(Pi/2)*(y
  -Pi/2)^3/3!,
  cos(Pi/2)+f1a(Pi/2)*(y-Pi/2)+f2a(Pi/2)*(y-Pi/2)^2/2+f3a(Pi/2)*(y
  -Pi/2)^3/3!+f4a(Pi/2)*(y-Pi/2)^4/4!+f5a(Pi/2)*(y-Pi/2)^5/5!],
  y=-Pi..2*Pi, color=[red,blue,green,black],
  style=[point,line,line,line]);
```