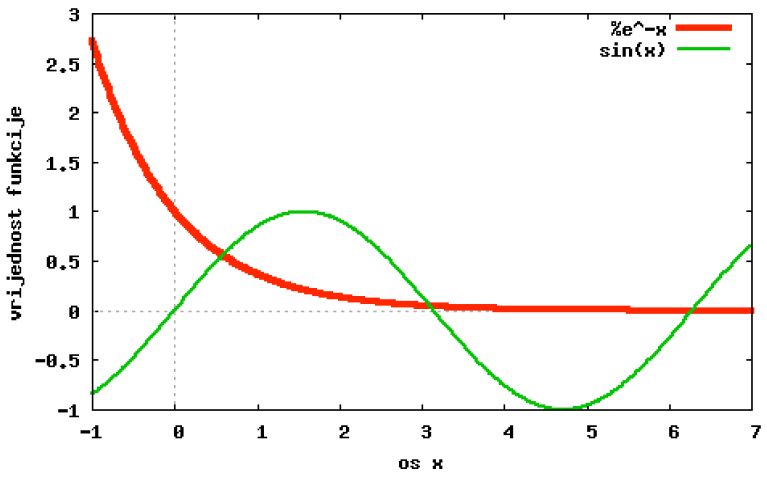
1 Grafičko prikazivanje funkcija i krivulja

```
(%i15) wxplot2d([exp(-x),sin(x)],[x,-1,7],
       [xlabel,"os x"],[ylabel,"vrijednost funkcije"],
       [color,red,green],[style,[lines,4],[lines,2]]);
```

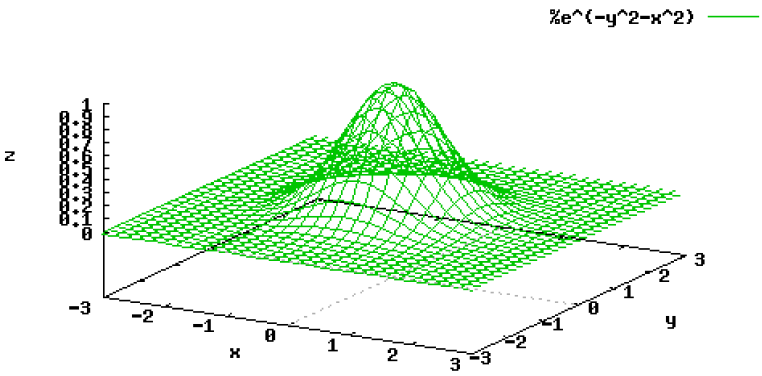
(%t15)



(%o15)

```
(%i18) wxplot3d(exp(-x^2-y^2),[x,-3,3],[y,-3,3],
       [palette,false],[color,green]);
```

(%t18)

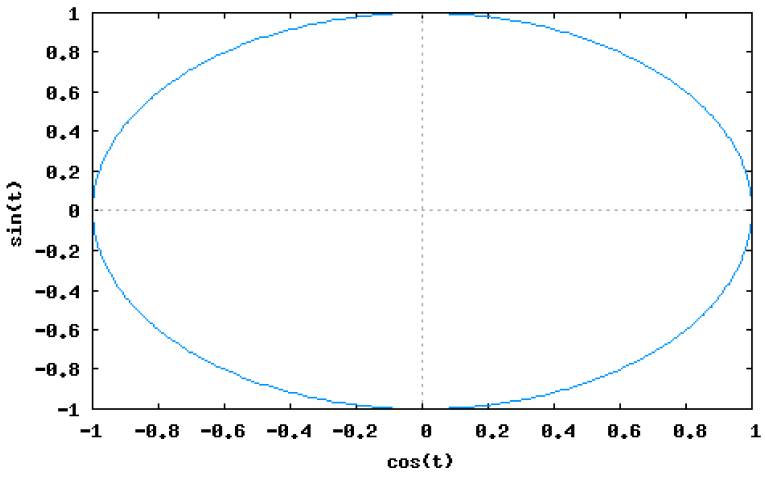


(%o18)

Parametarske koordinate

```
(%i115) wxplot2d([parametric,cos(t),sin(t),[t,0,2*%pi]],
        [nticks,400]
        );
```

(%t115)



(%o115)

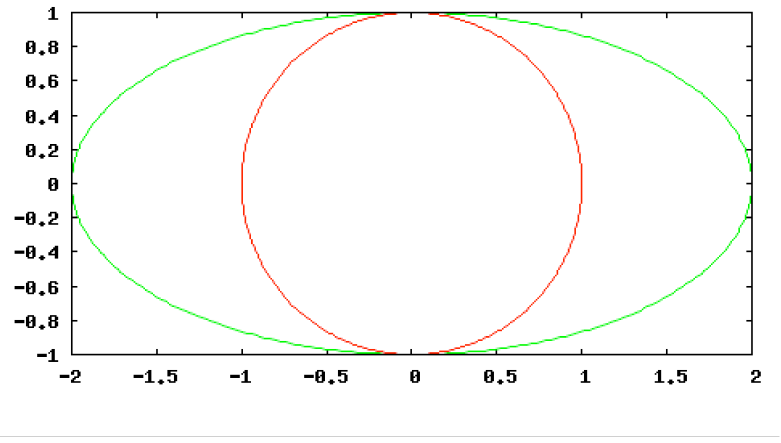
```
(%i32) load(draw);
(%o32) /Applications/Maxima.app/Contents/Resources/maxima/share/maxima/5.28.0/share/draw/draw.lisp

(%i33) kruznica:parametric(cos(t),sin(t),t,0,2*%pi);
(%o33) parametric(cos(t),sin(t),t,0,2 π)

(%i39) elipsa:parametric(2*cos(t),sin(t),t,0,2*%pi);
(%o39) parametric(2 cos(t),sin(t),t,0,2 π)

(%i42) wxdraw2d(nticks=400,color=red,kruznica,
        color=green, elipsa,proportional_axes=xy);
```

(%t42)



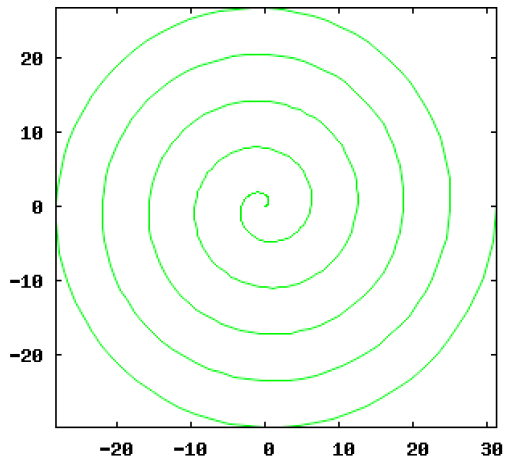
(%o42)

Polarne koordinate

```
(%i48) spirala:polar(t,t,0,10*%pi);
(%o48) polar(t,t,0,10 π)
```

```
--> wxdraw2d(nticks=400,color=green,spirala,
    proportional_axes=xy);
```

(%t53)



(%o53)

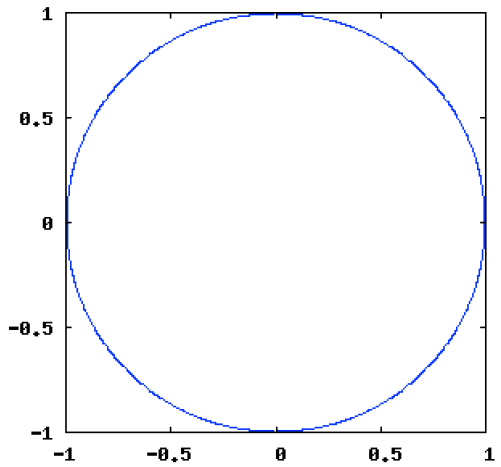
Implicitno zadane funkcije

```
(%i50) kruznica_imp:implicit(x^2+y^2=1,x,-1,1,y,-1,1);
```

(%o50) $\text{implicit}\left(y^2+x^2=1,x,-1,1,y,-1,1\right)$

```
(%i52) wxdraw2d(kruznica_imp,proportional_axes=xy);
```

(%t52)



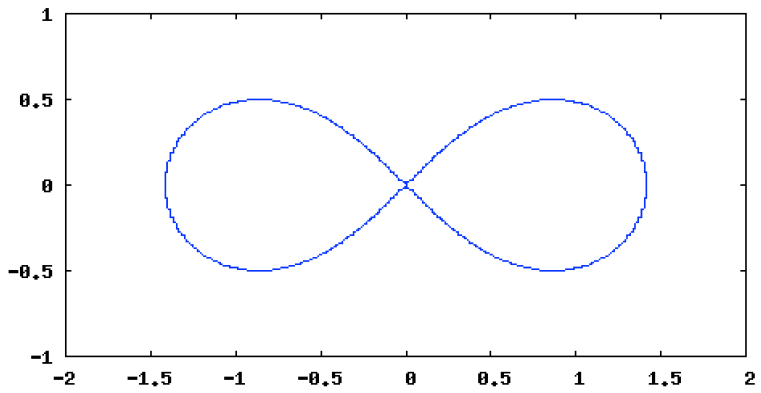
(%o52)

```
(%i148) lemniskata:implicit((x^2+y^2)^2=2*(x^2-y^2),x,-2,2,y,-1,1);
```

(%o148) $\text{implicit}\left(\left(y^2+x^2\right)^2=2\left(x^2-y^2\right),x,-2,2,y,-1,1\right)$

(%i59) wxdraw2d(lemniskata,proportional_axes=xy);

(%t59)



(%o59)

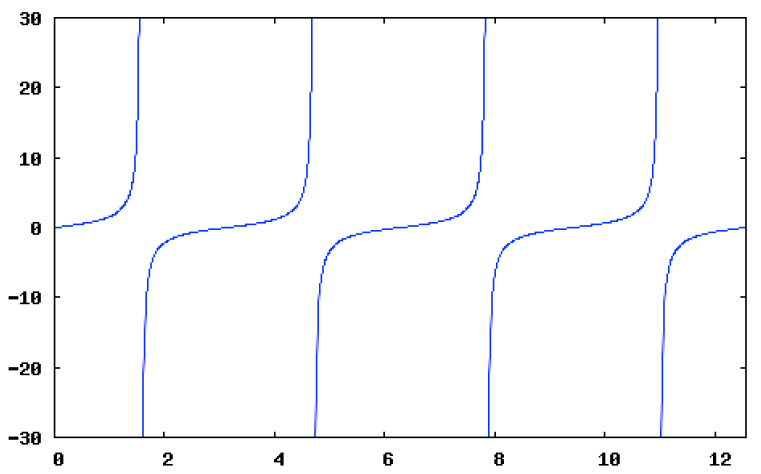
Eksplicitno zadane funkcije

(%i60) tangens:explicit(tan(x),x,0,4*%pi);

(%o60) explicit(tan(x), x, 0, 4 π)

(%i63) wxdraw2d(tangens,yrange=[-30,30]);

(%t63)



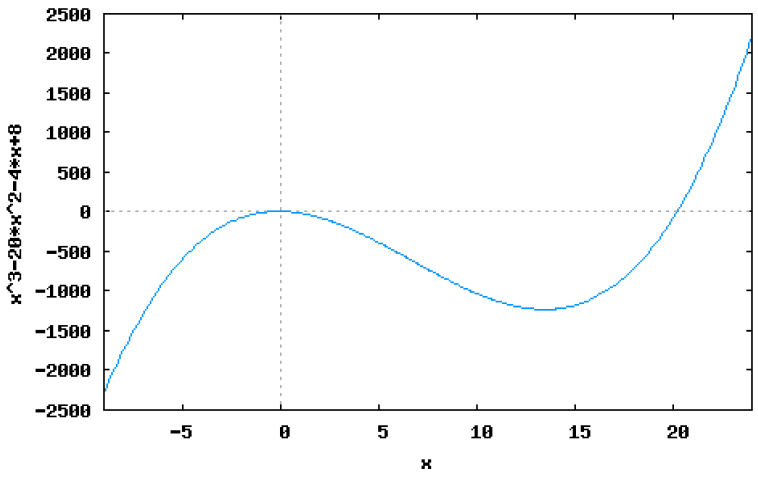
(%o63)

2 Zadavanje funkcija

(%i140) f(x):=x^3-20*x^2-4*x+8;

(%o140) f(x) := x^3 - 20 x^2 + (-4) x + 8

```
(%i138) wxplot2d(f(x),[x,-9,24]);
```



(%t138)

(%o138)

1. derivacija

```
(%i143) f1(x):=diff(f(x),x,1);
(%o143) f1(x):=diff(f(x),x,1)
```

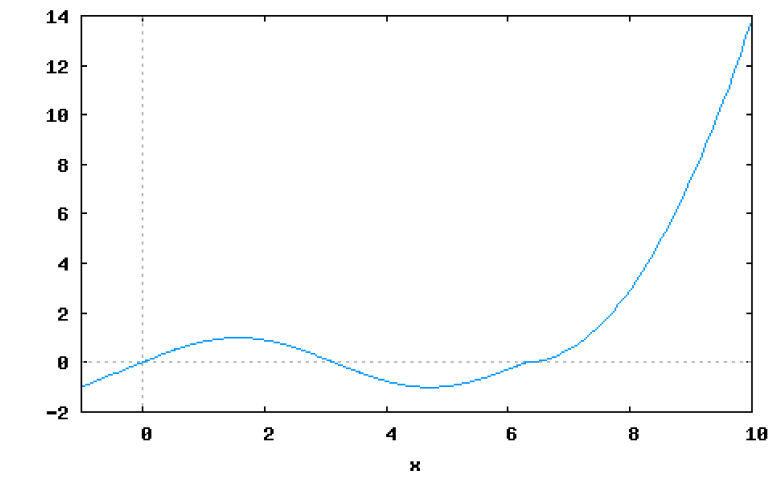
```
(%i144) f1(x);
(%o144) 3 x^2 -40 x -4
```

3. derivacija

```
(%i85) diff(f(x),x,3);
(%o85) 6
```

```
(%i86) g(x):=if x<0 then x
       else if x<=2*%pi then sin(x)
       else (x-2*%pi)^2;
(%o86) g(x):=if x<0 then x else if x<=2 π then sin(x) else (x-2 π)^2
```

```
(%i87) wxplot2d(g(x),[x,-1,10]);
```



(%t87)

(%o87)

Rekurzivno zadani niz

```
(%i88) a(n):=if n>1 then n*a(n-1)
       else 1;
(%o88) a(n):=if n>1 then n a(n-1) else 1
```

```
(%i89) a(3);
(%o89) 6
```

```
(%i92) a(10)-10!;
(%o92) 0
```

```
(%i93) for i:1 thru 5 do
       print(a(i));
1
2
6
24
120
(%o93) done
```

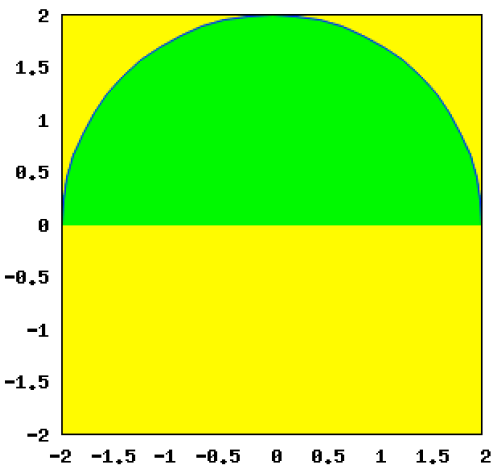
3 Crtanje geometrijskih objekata

```
(%i145) kvadrat:rectangle([-2,-2],[2,2]);
(%o145) rectangle([-2,-2],[2,2])
```

```
(%i146) polukrug:ellipse(0,0,2,2,0,180);
(%o146) ellipse(0,0,2,2,0,180)
```

```
(%i147) wxdraw2d(fill_color=yellow,kvadrat,
        fill_color=green,polukrug,
        proportional_axes=xy);
```

(%t147)



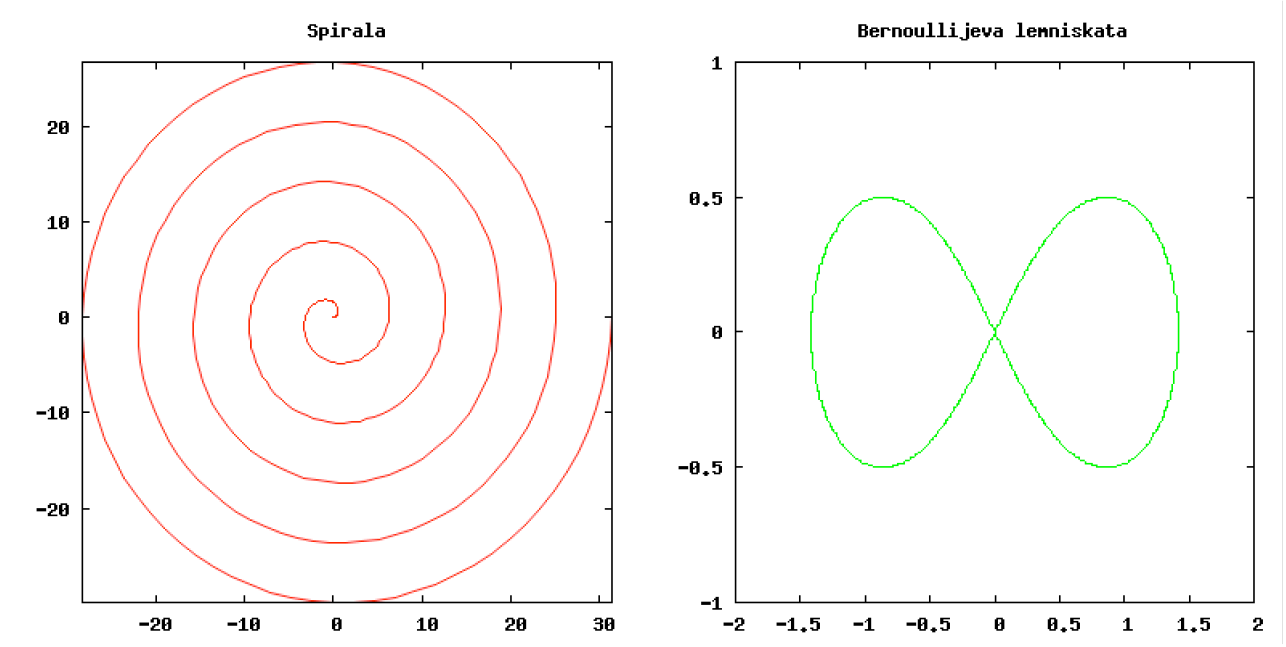
(%o147)

Crtanje više objekata zajedno

```
(%i106) spirala1:gr2d(nticks=400,color=red,spirala,
        title="Spirala");
(%o106) gr2d(nticks=400,color=red,polar(t,t,0,10 π),title=Spirala)
```

```
(%i149) lemniskata1:gr2d(nticks=400,color=green,lemniskata,
        title="Bernoullijeva lemniskata");
(%o149)
gr2d(nticks=400,color=green,implicit((y^2+x^2)^2=2 (x^2-y^2),x,-2,2,y,-1,1),title=Bernoullijeva lemniskata)
```

```
(%i155) wxdraw(columns=2,spirala1,lemniskata1,dimensions=[800,400]);
(%t155)
```




```
(%o155)
```