Lab1-Sage-rulat

February 20, 2021

[1]:
```
1-2
```

[1]:
```
-1
```

[2]:
```
1./2
```

[2]:
```
0.500000000000000
```

[3]:
```
numerical_approx(exp(1))
```

[3]:
```
2.71828182845905
```

[4]:
```
numerical_approx(pi)
```

[4]:
```
3.14159265358979
```

[5]:
```
x=var('x')
a=(x+1)^2
a.expand()
```

[5]:
```
x^2 + 2*x + 1
```

[6]:
```
a
```

[6]:
```
(x + 1)^2
```

[7]:
```
a=var('a')
```

[8]:
```
a
```

[8]:
```
a
```

[9]:
```
expand((x+1)^2)
```

[9]:
```
x^2 + 2*x + 1
```

[10]:
```
factor(x^8-1)
```

[10]:
```
(x^4 + 1)*(x^2 + 1)*(x + 1)*(x - 1)
```

[11]:
```
c=sin(x)^2+cos(x)^2
```

[12]:
```
c.trig_simplify()
```

[12]:
```
1
```

[13]:
```
factor(1/x+1/(x+1))
```

[13]:
```
(2*x + 1)/((x + 1)*x)
```

[14]:
```
x
```

[14]:
```
x
```

[15]:
```
y=var('y')
```

[16]:
```
eq2=x^2*y+2*y-x==0
solve(eq2,y)
```

[16]:
```
[y == x/(x^2 + 2)]
```

[17]:
```
solve(x-cos(x)==0,x)
```

[17]:
```
[x == cos(x)]
```

[18]:
```
find_root(x-cos(x)==0,-1,1)
```

[18]:
```
0.7390851332151607
```

[19]:
```
solve(x^5-3*x^3-1,x)
```

[19]:
```
[0 == x^5 - 3*x^3 - 1]
```

[20]:
```
find_root(x^5-3*x^3-1,-2,-1)
```

[20]:
```
-1.6687775925403805
```

[21]:
```
find_root(x^5-3*x^3-1,-1,0)
```

[21]:
```
-0.7418139304867688
```

[22]:
```
find_root(x^5-3*x^3-1,0,2)
```

[22]:
```
1.782308780045884
```

[23]:
```
solve(x^2*y+2*y-x==0,y)
```

[23]:
```
[y == x/(x^2 + 2)]
```

[24]:
```
syst=[x+2*y==1,x-y==3]
solve(syst,x,y)
```

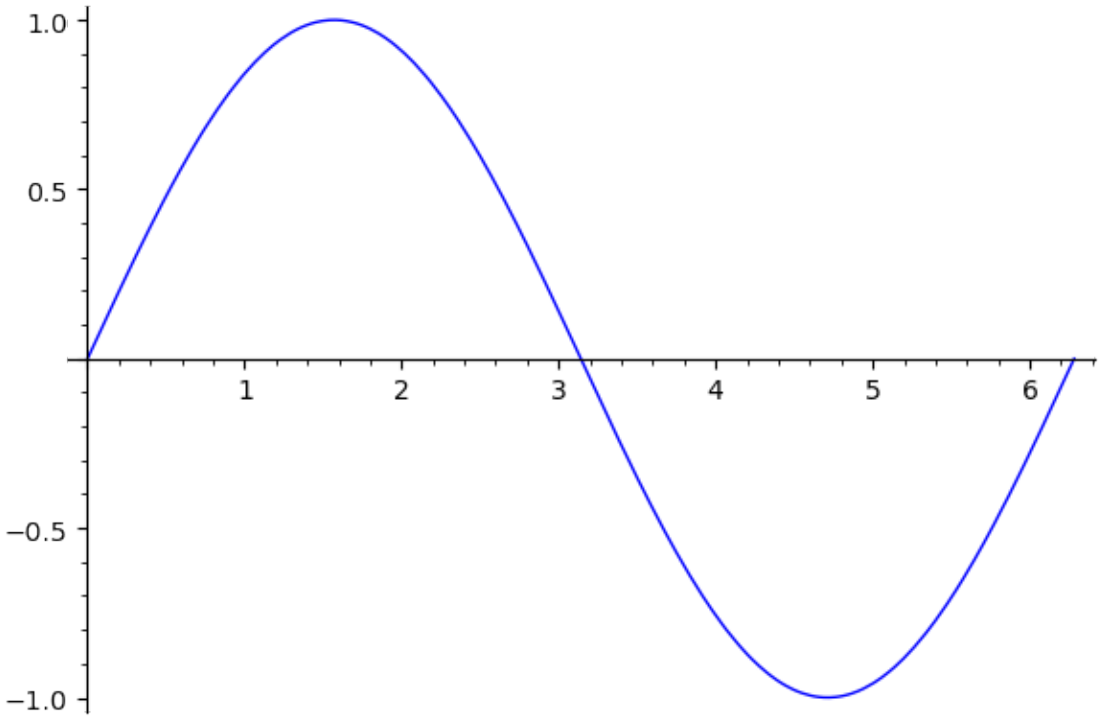
[24]:
```
[[x == (7/3), y == (-2/3)]]
```

[25]:
```
solve([x+2*y==1,x-y==3],x,y)
```

[25]:
```
[[x == (7/3), y == (-2/3)]]
```

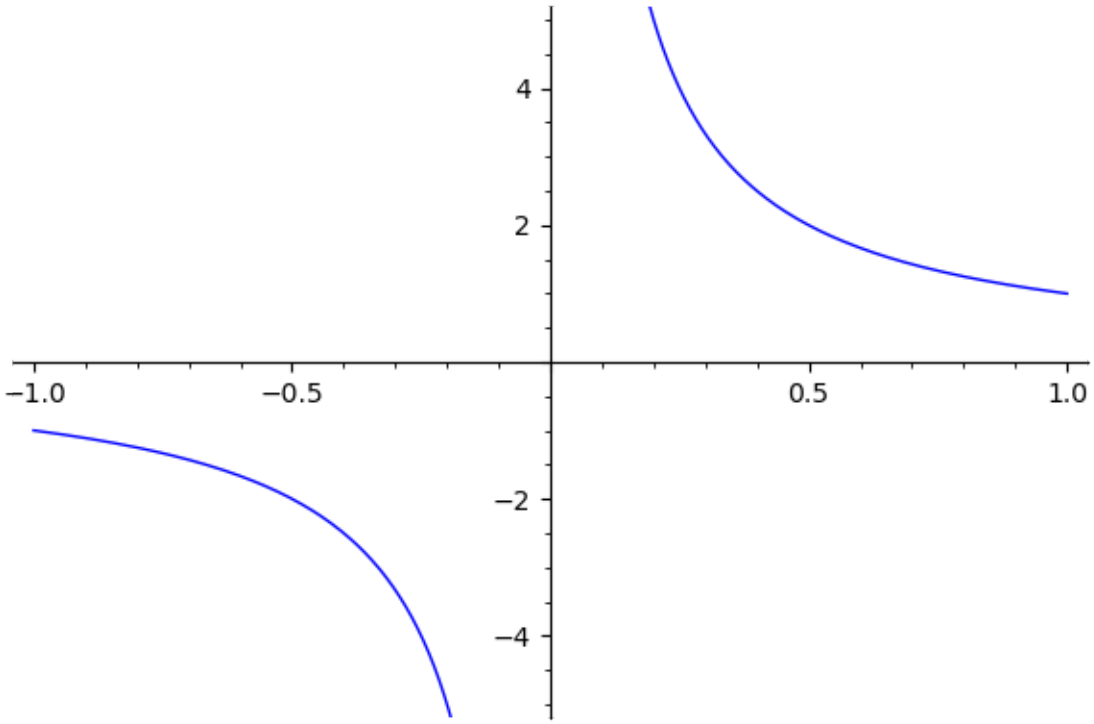
[26]:
```
x=var('x')
plot(sin(x),0,2*pi)
```

[26]:



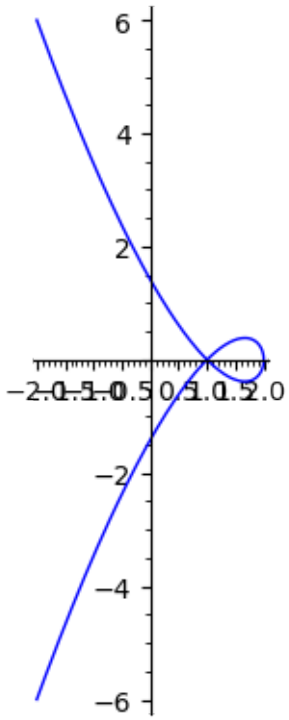
[27]:
```
plot(1/x,-1,1,detect_poles=True,ymin=-5,ymax=5)
```

[27]:



[28]:
```
t=var('t')
parametric_plot((2-t^2,t-t^3),(t,-2,2))
```

[28]:



[29]:
```
x=var('x')
y=var('y')
plot3d(x^2+y^2,(x,-2,2),(y,-2,2))
```

[29]: Graphics3d Object

[ ]: