

Page 50

```
In [1]: var('a,b')
# We declare to the program that symbols 'a' and 'b' are variables.

(3*a*(2*b+4)+3*b*(2*a+5)).expand() # Multiplication has to be written explicitly.
```

Out[1]: $12ab + 12a + 15b$

```
In [1]: var('a,b')
# We declare to the program that symbols 'a' and 'b' are variables.

show((3*a*(2*b+4)+3*b*(2*a+5)).expand()) # Better notation
```

Out[1]:

Page 56

```
In [3]: show((6661029375).factor())
```

Out[3]:

Page 59

```
In [4]: gcd(gcd(135,2520),300)
```

Out[4]: 15

```
In [5]: lcm(lcm(135,2520),300)
```

Out[5]: 37800

Page 123

```
In [6]: var('m,n,k')
show(((6*m^3*n^3*k+4*m^2*n^4)/(2*m^3*n^3)).simplify_full())
```

Out[6]:

Page 154

```
In [7]: solve((1+2*(4-x))/2-(2-x)/3==(6-2*x)/4+5/2,x) # The sign for equality in
the equation is written as ==!
```

Out[7]: $[x == -1]$

Page 161

```
In [8]: var('R,R1,R2')
show(solve(1/R==1/R1+1/R2,R2))
```

Out[8]:

Page 170

```
In [9]: var('y')
solve([-3*x+5*y==8,x+7*y==6],x,y)
```

Out[9]: [[x == -1, y == 1]]

Page 171

```
In [10]: var('s1,s2,t,v1,v2,d')
show(solve([s1==v1*t,s2==v2*t,d==s1+s2],s1,s2,t))
```

Out[10]:

Page 222

```
In [11]: Rational(0.25), (2/3).n(), Rational(2/3.n()), (Rational(0.25)).n()
```

Out[11]: (1/4, 0.6666666666666667, 2/3, 0.2500000000000000)

Page 260

```
In [12]: print(pi.n()) # We calculate number pi to SageMath default precision.
print(pi.n(digits = 50)) # We calculate number pi to 50 significant digits.
print(round(pi,5)) # We round number pi to the fifth decimal.
```

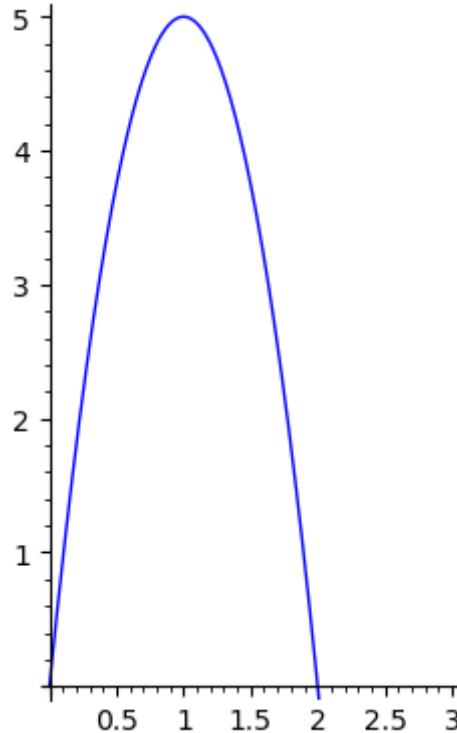
3.14159265358979
3.1415926535897932384626433832795028841971693993751
3.14159

Page 281

In [13]:

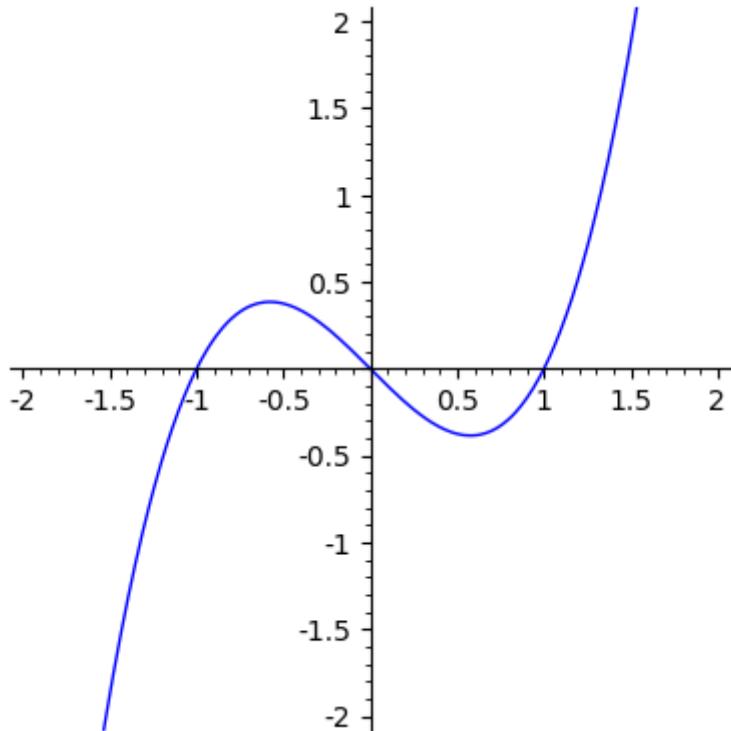
```
var('t')
plot(10*t-5*t^2,(t,0,3), ymin = 0, aspect_ratio=1)
# First input in the command is the function we are plotting,
# second input tells us the interval on which we plot it,
# the remaining two inputs are optional,
#- the first sets the lower limit to value plotting,
# since we are not interested in negative heights,
#- the second says that the same units are on both axes.
```

Out[13]:

**Page283**

```
In [1]: plot(x^3-x, (x,-2,2), ymin = -2, ymax=2, aspect_ratio = 1)
```

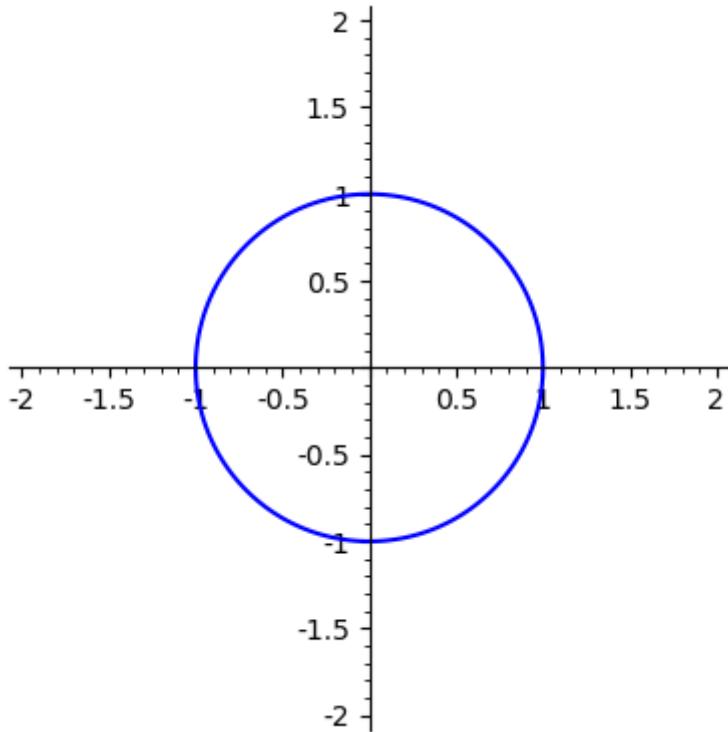
Out[1]:



Page 284

```
In [14]: var('y')
implicit_plot(x^2+y^2==1, (x,-2,2), (y,-2,2), aspect_ratio = 1, axes = true, frame = false)
# The first two inputs tell the software which equation we are plotting
# and in which area of the plane.
# Other inputs are optional - the last two define
# that we will get a coordinate system with axes and not frames,
# which is default for the command implicit_plot.
```

Out[14]:

**Page 285**

```
In [17]: var('y')
implicit_plot((x^2+y^2)^2==4*(x^2-y^2), (x,-2.5,2.5), (y,-1,1), aspect_ratio = 1, gridlines = 'minor')+implicit_plot(x^2+y^2==1, (x,-2.5,2.5), (y,-1,1), axes = true, frame = false, color = 'red')
```

Out[17]:

