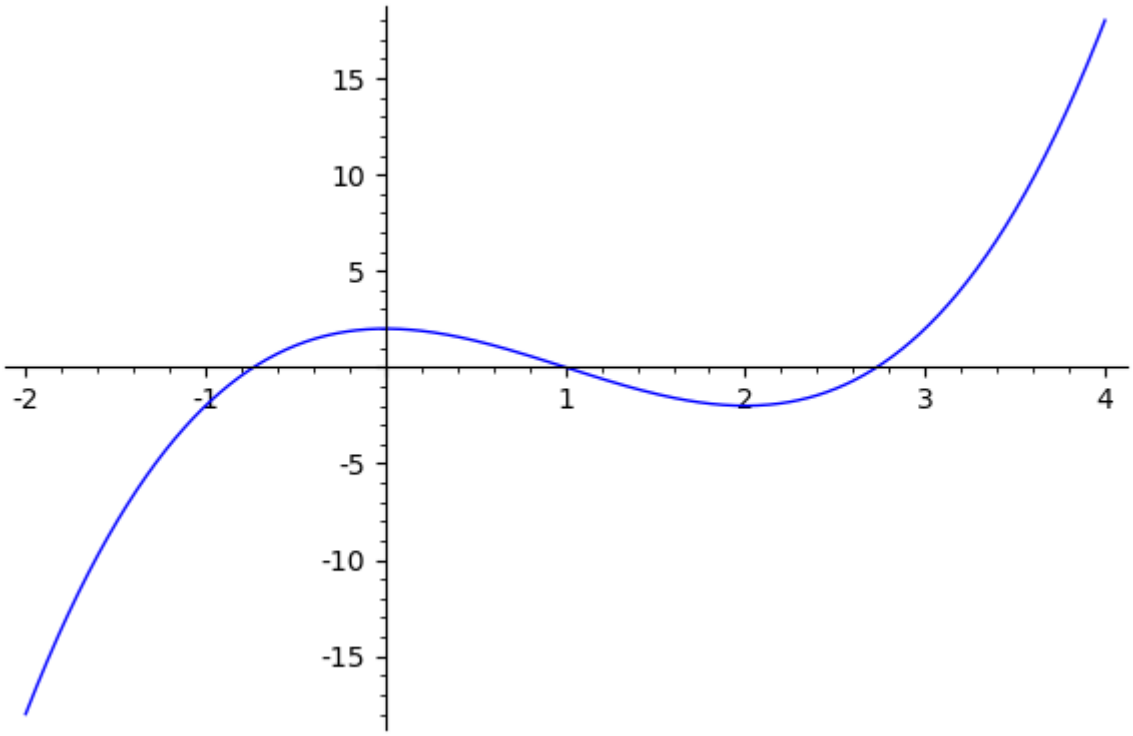
In [1]:
```
f(x)=x^3-3*x^2+2
show(f)
```

Out[1]:

$$x \mapsto x^3 - 3\,x^2 + 2$$

In [2]:
```
plot(f(x),x,-2,4)
```

Out[2]:



In [3]:
```
S=solve(f(x)==0,x)
show(S)
```

Out[3]:

$$\left[x = -\sqrt{3} + 1, x = \sqrt{3} + 1, x = 1\right]$$

In [4]:
```
show(S[0])
show(S[1])
show(S[2])
```

Out[4]:

$$x = -\sqrt{3} + 1$$

Out[4]:

$$x = \sqrt{3} + 1$$

Out[4]:

$$x = 1$$

In [5]:
```
(f(x)==0).find_root(2,3,x)
```

Out[5]:
```
2.7320508075688776
```

In [6]:
```
RR(sqrt(3)+1)
```

Out[6]:
```
2.73205080756888
```

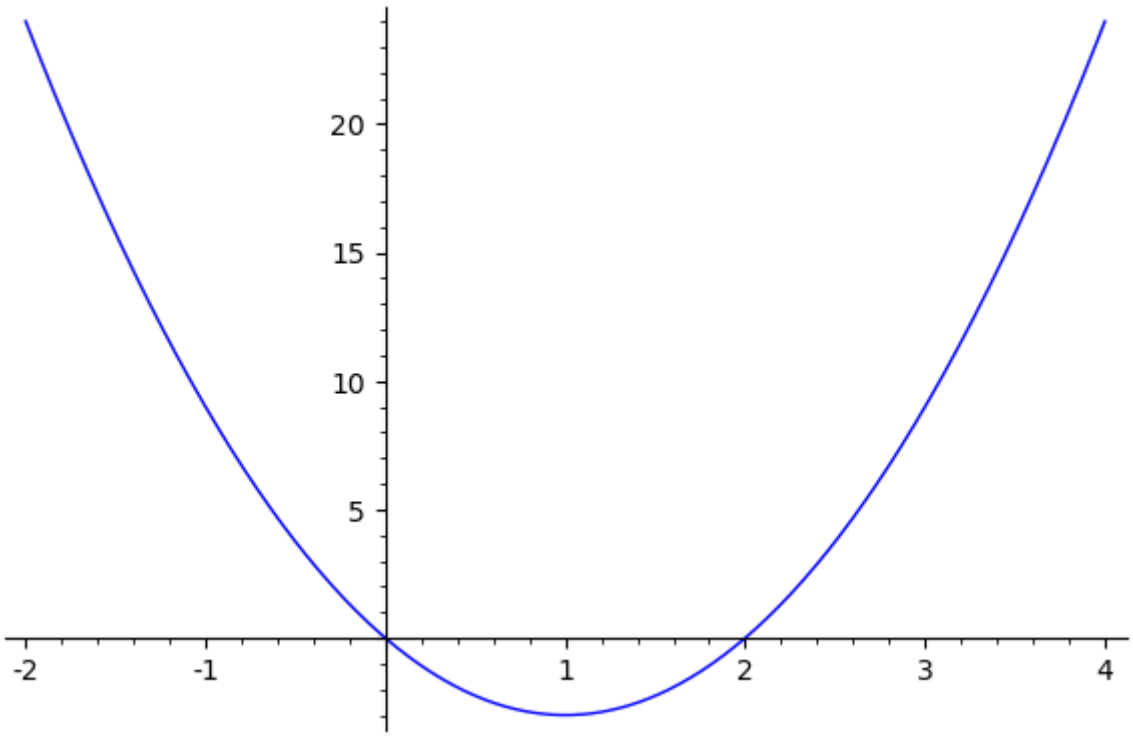
In [7]:
```
fdash(x)=derivative(f(x),x)
show(fdash)
```

Out[7]:

$$x \mapsto 3\,x^2 - 6\,x$$

In [8]:
```
plot(fdash(x),x,-2,4)
```

Out[8]:



In [9]:
```
g(x)=sin(x)*cos(x)^3
show(g)
```

Out[9]:

$$x \mapsto \cos\left(x\right)^3 \sin(x)$$

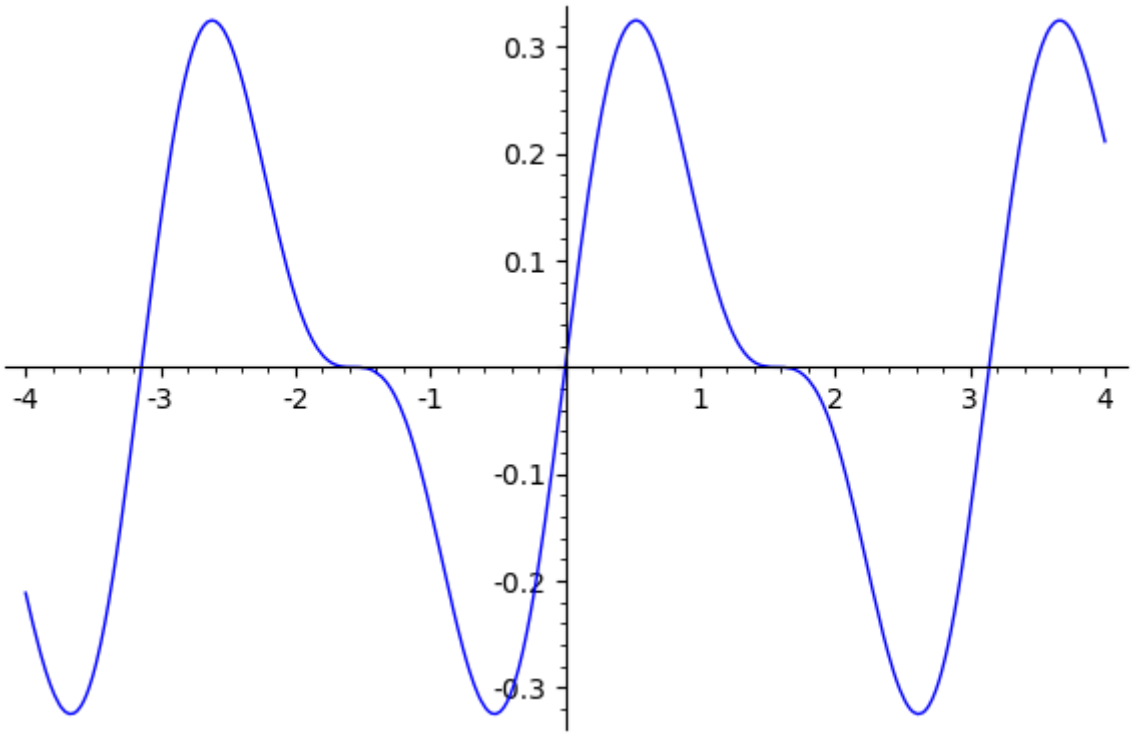
In [10]:
```
show(integrate(g(x),x))
```

Out[10]:

$$-\frac{1}{4}\cos\left(x\right)^4$$

In [11]:
```
plot(g(x),x,-4,4)
```

Out[11]:



In [12]:
```
h(x)=ln(sec(x))
show(h)
```

Out[12]:

$$x \mapsto \log(\sec(x))$$

In [13]:
```
show(integrate(sqrt(1+(diff(h(x),x))^2),x,0,pi/4))
```

Out[13]:

$$\operatorname{arsinh}(1)$$

In [14]:
```
RR(ln(sqrt(2)+1))
```

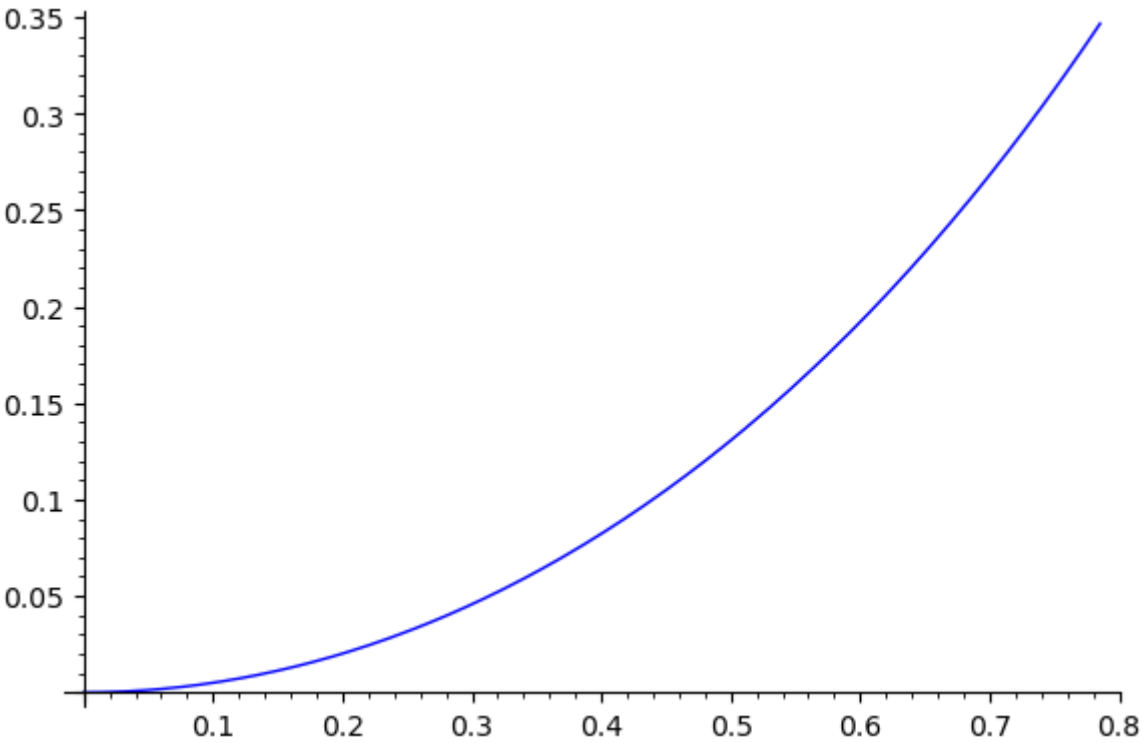
Out[14]: 0.881373587019543

In [15]:
```
RR(arcsinh(1))
```

Out[15]: 0.881373587019543

In [16]:
```
plot(h(x),x,0,pi/4)
```

Out[16]:



In [17]:
```
A=matrix([[1,2,1,-1],[1,2,5,1],[1,2,-3,-3]])
show(A)
```

Out[17]:

$$\begin{pmatrix} 1 & 2 & 1 & -1 \\ 1 & 2 & 5 & 1 \\ 1 & 2 & -3 & -3 \end{pmatrix}$$

In [18]:
```
b=vector([1,2,0])
show(b)
```

Out[18]:

$$(1, 2, 0)$$

In [19]:
```
AM=A.augment(b)
show(AM)
```

Out[19]:

$$\begin{pmatrix} 1 & 2 & 1 & -1 & 1 \\ 1 & 2 & 5 & 1 & 2 \\ 1 & 2 & -3 & -3 & 0 \end{pmatrix}$$

In [20]:
```
show(AM.rref())
```

Out[20]:

$$\begin{pmatrix} 1 & 2 & 0 & -\frac{3}{2} & \frac{3}{4} \\ 0 & 0 & 1 & \frac{1}{2} & \frac{1}{4} \\ 0 & 0 & 0 & 0 & 0 \end{pmatrix}$$

In [0]: