

□ 1 Liste

```
(%i1) a:[1,4,6,5,23,31,-23,4];
(%o1) [1, 4, 6, 5, 23, 31, -23, 4]
```

```
(%i2) a[5];
(%o2) 23
```

```
(%i3) member(4,a);
(%o3) true
```

```
(%i4) member(2,a);
(%o4) false
```

```
(%i5) sort(a);
      sort(a,">");
      sort(a,"<");
(%o5) [-23, 1, 4, 4, 5, 6, 23, 31]
(%o6) [31, 23, 6, 5, 4, 4, 1, -23]
(%o7) [-23, 1, 4, 4, 5, 6, 23, 31]
```

```
(%i8) length(a);
(%o8) 8
```

```
(%i9) b:makelist(i^2,i,1,50);
(%o9) [1, 4, 9, 16, 25, 36, 49, 64, 81, 100, 121, 144, 169, 196, 225, 256, 289, 324, 361, 400, 441, 484, 529, 576, 625,
676, 729, 784, 841, 900, 961, 1024, 1089, 1156, 1225, 1296, 1369, 1444, 1521, 1600, 1681, 1764, 1849, 1936, 2025, 2116,
2209, 2304, 2401, 2500]
```

```
(%i10) sum(b[i],i,1,50);
(%o10) 42925
```

```
(%i11) prod(exp(-b[i]),i,1,50);
(%o11) %e-42925
```

```
(%i12) a;
(%o12) [1, 4, 6, 5, 23, 31, -23, 4]
```

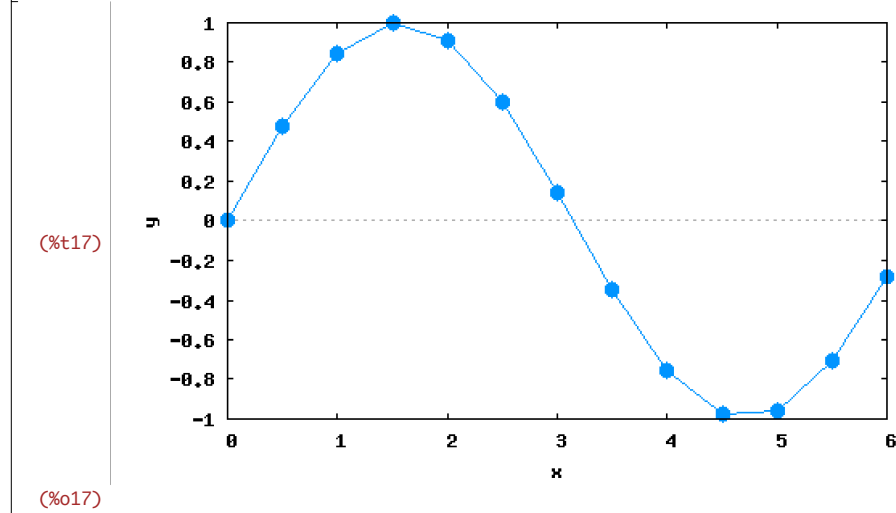
```
(%i13) rest(a,6);
(%o13) [-23, 4]
```

```
(%i14) rest(a,-3);
(%o14) [1, 4, 6, 5, 23]
```

```
(%i15) c:append(a,b);
(%o15) [1, 4, 6, 5, 23, 31, -23, 4, 1, 4, 9, 16, 25, 36, 49, 64, 81, 100, 121, 144, 169, 196, 225, 256, 289, 324, 361, 400,
441, 484, 529, 576, 625, 676, 729, 784, 841, 900, 961, 1024, 1089, 1156, 1225, 1296, 1369, 1444, 1521, 1600, 1681, 1764,
1849, 1936, 2025, 2116, 2209, 2304, 2401, 2500]
```

```
(%i16) d:makelist([x,sin(x)],x,0,2*pi,0.5);
(%o16) [[0, 0], [0.5, 0.479425538604203], [1.0, .8414709848078965], [1.5, .9974949866040544], [2.0,
.9092974268256817], [2.5, .5984721441039565], [3.0, .1411200080598672], [3.5, -.3507832276896198], [4.0, -
.7568024953079282], [4.5, -0.977530117665097], [5.0, -.9589242746631385], [5.5, -.7055403255703919], [6.0, -
.2794154981989259]]
```

```
(%i17) wxplot2d([discrete,d],[style,linespoints]);
```



```
(%i18) f(x):=x+2;
```

```
(%o18) f(x) := x+2
```

```
(%i19) a;
map(f,a);
map(sin,a);
```

```
(%o19) [1, 4, 6, 5, 23, 31, -23, 4]
```

```
(%o20) [3, 6, 8, 7, 25, 33, -21, 6]
```

```
(%o21) [sin(1), sin(4), sin(6), sin(5), sin(23), sin(31), -sin(23), sin(4)]
```

```
(%i22) kill(all);
```

```
(%o0) done
```

□ 2 Matrice

```
(%i1) A:matrix([1,2],[3,4]);
```

```
(%o1)  $\begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$ 
```

```
(%i2) B:matrix([0,2],[3,1]);
```

```
(%o2)  $\begin{bmatrix} 0 & 2 \\ 3 & 1 \end{bmatrix}$ 
```

☑ Hadamardov produkt matrica

```
(%i3) A*B;
```

```
(%o3)  $\begin{bmatrix} 0 & 4 \\ 9 & 4 \end{bmatrix}$ 
```

☑ Množenje matrica

```
(%i4) C:A.B;
```

```
(%o4)  $\begin{bmatrix} 6 & 4 \\ 12 & 10 \end{bmatrix}$ 
```

```
(%i5) load(nchrpl);
```

```
(%o5) /Applications/Maxima.app/Contents/Resources/maxima/share/maxima/5.28.0/share/matrix/nchrpl.mac
```

```
(%i6) determinant(C);
(%o6) 12
```

```
(%i7) D:invert(C);
(%o7) 
$$\begin{bmatrix} \frac{5}{6} & -\frac{1}{3} \\ -1 & \frac{1}{2} \end{bmatrix}$$

```

```
(%i8) D.C;
(%o8) 
$$\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$$

```

```
(%i9) E:matrix([1,2],[2,4]);
(%o9) 
$$\begin{bmatrix} 1 & 2 \\ 2 & 4 \end{bmatrix}$$

```

```
(%i10) determinant(E);
(%o10) 0
```

```
(%i11) invert(E);
expt: undefined: 0 to a negative exponent.
-- an error. To debug this try: debugmode(true);
```

```
(%i12) A;
transpose(A);
(%o12) 
$$\begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$$

(%o13) 
$$\begin{bmatrix} 1 & 3 \\ 2 & 4 \end{bmatrix}$$

```

```
(%i14) mattrace(A);
(%o14) 5
```

```
(%i15) mattrace(A.B);
mattrace(B.A);
(%o15) 16
(%o16) 16
```

```
(%i17) A.B;
B.A;
(%o17) 
$$\begin{bmatrix} 6 & 4 \\ 12 & 10 \end{bmatrix}$$

(%o18) 
$$\begin{bmatrix} 6 & 8 \\ 6 & 10 \end{bmatrix}$$

```

```
(%i19) kill(A);
(%o19) done
```

```
(%i20) A:matrix([2,3],[3,2]);
      b:[5,9];
      x:invert(A).b;
      A.x;
(%o20)  $\begin{bmatrix} 2 & 3 \\ 3 & 2 \end{bmatrix}$ 
(%o21)  $[5, 9]$ 
(%o22)  $\begin{bmatrix} \frac{17}{5} \\ \frac{3}{5} \end{bmatrix}$ 
(%o23)  $\begin{bmatrix} 5 \\ 9 \end{bmatrix}$ 
```

```
(%i24) x:linsolve_by_lu(A,b)[1];
(%o24)  $\begin{bmatrix} \frac{17}{5} \\ \frac{3}{5} \end{bmatrix}$ 
```

□ 3 Rješavanje jednažbi

```
(%i25) kill(all);
(%o0) done
```

```
(%i1) x:solve(a*x^2+b*x+c=0,x);
(%o1)  $[x = -\frac{\sqrt{b^2 - 4ac} + b}{2a}, x = \frac{\sqrt{b^2 - 4ac} - b}{2a}]$ 
```

```
(%i2) x[1];
(%o2)  $x = -\frac{\sqrt{b^2 - 4ac} + b}{2a}$ 
```

```
(%i3) x[2];
(%o3)  $x = \frac{\sqrt{b^2 - 4ac} - b}{2a}$ 
```

```
(%i4) kill(x);
(%o4) done
```

```
(%i5) solve([x^2+y^2=1,x^2/4+4*y^2=1],[x,y]);
(%o5)  $[[x = -\frac{2}{\sqrt{5}}, y = -\frac{1}{\sqrt{5}}], [x = -\frac{2}{\sqrt{5}}, y = \frac{1}{\sqrt{5}}], [x = \frac{2}{\sqrt{5}}, y = -\frac{1}{\sqrt{5}}], [x = \frac{2}{\sqrt{5}}, y = \frac{1}{\sqrt{5}}]]$ 
```