```
> s:=[1,4,25,9,16,25];
```

$$s := [1, 4, 25, 9, 16, 25]$$

```
> [seq(i^2, i=1..5)];
```

$$[1, 4, 9, 16, 25]$$

```
> nops(s);
```

$$6$$

```
> L:=[seq(rand(0..10)(), i=1..10)];
```

$$L := [6, 9, 5, 1, 10, 3, 5, 4, 10, 0]$$

```
> select(x->x<5, L);
```

$$[1, 3, 4, 0]$$

```
> M1:={b,a,c};
```

$$M1 := \{a, b, c\}$$

```
> M3:=[1,1,2,2,3,3];
```

$$M3 := [1, 1, 2, 2, 3, 3]$$

```
> M4:=convert(M3, set);
```

$$M4 := \{1, 2, 3\}$$

```
> convert(M4, list);
```

$$[1, 2, 3]$$

```
> M2:={a,b};
```

$$M2 := \{a, b\}$$

```
> M1 union M2;
```

$$\{a, b, c\}$$

```
> M1 intersect M2;
```

$$\{a, b\}$$

```
> M1 minus M2;
```

$$\{c\}$$

```
> with(LinearAlgebra):
> d:=Matrix([[1,2,3], [1,4,9], [1,16,27]]);
```

$$d := \begin{bmatrix} 1 & 2 & 3 \\ 1 & 4 & 9 \\ 1 & 16 & 27 \end{bmatrix}$$

```
> h:=(i,j)->1/(i+j-x):
> h4:=Matrix(4,4,h);
```

$$h4 := \begin{bmatrix} \frac{1}{2-x} & \frac{1}{3-x} & \frac{1}{4-x} & \frac{1}{5-x} \\ \frac{1}{3-x} & \frac{1}{4-x} & \frac{1}{5-x} & \frac{1}{6-x} \\ \frac{1}{4-x} & \frac{1}{5-x} & \frac{1}{6-x} & \frac{1}{7-x} \\ \frac{1}{5-x} & \frac{1}{6-x} & \frac{1}{7-x} & \frac{1}{8-x} \end{bmatrix}$$

```
> C:=Transpose(d);
```

$$C := \begin{bmatrix} 1 & 1 & 1 \\ 2 & 4 & 16 \\ 3 & 9 & 27 \end{bmatrix}$$

```
> d.C;
```

$$\begin{bmatrix} 14 & 36 & 114 \\ 36 & 98 & 308 \\ 114 & 308 & 986 \end{bmatrix}$$

```
> E:=MatrixInverse(d);
```

$$E := \begin{bmatrix} 1 & \frac{1}{6} & -\frac{1}{6} \\ \frac{1}{2} & -\frac{2}{3} & \frac{1}{6} \\ -\frac{1}{3} & \frac{7}{18} & -\frac{1}{18} \end{bmatrix}$$

```
> d.E;
```

$$\begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$$

```
> Rank(d);
```

$$3$$

```
> Determinant(d);
```

$$-36$$

```
(%i1) s:[1,4,25,9,16,25];
(%o1) [1,4,25,9,16,25]

(%i2) makelist(i^2, i,1,5);
(%o2) [1,4,9,16,25]

(%i3) length(s);
(%o3) 6

(%i4)  L : makelist(random(11),i,1,10);
(%o4) [6,3,10,9,4,7,0,6,5,4]

(%i5) f(x):=is(x<5)$

(%i6) sublist(L,f);
(%o6) [3,4,0,4]

(%i7) M1:{b,a,c};
(%o7) {a,b,c}

(%i8) M3:[1,1,2,3,3,3];
(%o8) [1,1,2,3,3,3]

(%i9) M4:setify(M3);
(%o9) {1,2,3}

(%i10) listify(M4);
(%o10) [1,2,3]

(%i11) M2:{a,b};
(%o11) {a,b}

(%i12) union(M1,M2);
(%o12) {a,b,c}

(%i13) intersect(M1,M2);
(%o13) {a,b}

(%i14)  setdifference(M1,M2);
(%o14) {c}
```

```
(%i15) D:matrix([1,2,3],[1,4,9],[1,16,27]);
```

$$(\%o15)\ \begin{bmatrix} 1 & 2 & 3 \\ 1 & 4 & 9 \\ 1 & 16 & 27 \end{bmatrix}$$

```
(%i16) h[i,j]:=1/(i+j-x);
```

$$(\%o16)\ h_{i,j} := \frac{1}{i+j-x}$$

```
(%i17) h4:genmatrix(h,4,4);
```

$$(\%o17)\ \begin{bmatrix} \frac{1}{2-x} & \frac{1}{3-x} & \frac{1}{4-x} & \frac{1}{5-x} \\ \frac{1}{3-x} & \frac{1}{4-x} & \frac{1}{5-x} & \frac{1}{6-x} \\ \frac{1}{4-x} & \frac{1}{5-x} & \frac{1}{6-x} & \frac{1}{7-x} \\ \frac{1}{5-x} & \frac{1}{6-x} & \frac{1}{7-x} & \frac{1}{8-x} \end{bmatrix}$$

```
(%i18) C:transpose(D);
```

$$(\%o18)\ \begin{bmatrix} 1 & 1 & 1 \\ 2 & 4 & 16 \\ 3 & 9 & 27 \end{bmatrix}$$

```
(%i19) D.C;
```

$$(\%o19)\ \begin{bmatrix} 14 & 36 & 114 \\ 36 & 98 & 308 \\ 114 & 308 & 986 \end{bmatrix}$$

```
(%i20) E:invert(D);
```

$$(\%o20)\ \begin{bmatrix} 1 & \frac{1}{6} & -\frac{1}{6} \\ \frac{1}{2} & -\frac{2}{3} & \frac{1}{6} \\ -\frac{1}{3} & \frac{7}{18} & -\frac{1}{18} \end{bmatrix}$$

```
(%i21) D.E;
       [1  0  0]
       [       ]
(%o21) [0  1  0]
       [       ]
       [0  0  1]
```

```
(%i22) rank(D);
(%o22) 3
```

```
(%i23) determinant(D);
(%o23) -36
```