```
> for i from 1 by 1 to 5 do
  print(i);
  end do;
```

$$1$$

$$2$$

$$3$$

$$4$$

$$5$$

```
for i from 2 by 2 to 6 do
Sum(j^i, j=1..n)=expand(sum(j^i, j=1..n));
end do;
```

$$\sum_{j=1}^{n} j^2 = \frac{1}{3} n^3 + \frac{1}{2} n^2 + \frac{1}{6} n$$

$$\sum_{j=1}^{n} j^4 = \frac{1}{5} n^5 + \frac{1}{2} n^4 + \frac{1}{3} n^3 - \frac{1}{30} n$$

$$\sum_{j=1}^{n} j^6 = \frac{1}{42} n - \frac{1}{6} n^3 + \frac{1}{2} n^5 + \frac{1}{2} n^6 + \frac{1}{7} n^7$$

```
> s:=0:
  seznam:=[1,2,3,4,5]:
  for n in seznam do
  if irem(n,2)=0 then s:=s+n^2 fi
  od:
```

```
> s;
```

$$20$$

```
> x:=256;
```

$$x := 256$$

```
> while x>1 do x:=x/4 end do;
```

$$x := 64$$

$$x := 16$$

$$x := 4$$

$$x := 1$$

```
> a:=20: b:=12:
  while b<>0 do
   d:=irem(a,b);
   a:=b;
   b:=d;
  end do;
```

$$d := 8$$

$$a := 12$$

$$b := 8$$

$$d := 4$$

$$a := 8$$

$$b := 4$$

$$d := 0$$

$$a := 4$$

$$b := 0$$

```
> lprint(`celociselny NSD je`,a);
```

```
`celociselny NSD je`, 4
```

```
> euclid:=proc(m::posint,n::posint)
  local a,b,r:
  a:=m:
  b:=n:
  r:=irem(a,b):
  while r<>0 do
  a:=b:
  b:=r:
  r:=irem(a,b):
  od:
  b:
  end:
```

```
> euclid(20,12);
```

$$4$$

```
> for i from 3 by 2 do
  if isprime(2^i-1)
  then print(2^i-1,`je prvocislo`)
  else break
  end if
  end do;
```

$$7, \textit{je prvocislo}$$

$$31, \textit{je prvocislo}$$

$$127, \textit{je prvocislo}$$

```
> max3:=proc(a,b,c)
  print(`nalezeni maxima z cisel`, a,b,c);
  if a<b then
   if b<c then c else b end if
   elif a<c then c
   else a
  end if;
```

```
  end:
> max3(3,2,1);
```

nalezeni maxima z cisel, 3, 2, 1

3

```
> save(max3, "max3.txt");
> restart;
> read "max3.txt";
```

max3 := **proc**(*a*, *b*, *c*)

print(`*nalezeni maxima z cisel*`, *a*, *b*, *c*);

if *a* < *b* **then if** *b* < *c* **then** *c* **else** *b* **end if elif** *a* < *c* **then** *c* **else** *a*

end if

end proc

```
> max3(1,2,3);
```

nalezeni maxima z cisel, 1, 2, 3

3

```
> maxN:=proc() local result, i;
  if not (type([args], list(numeric)))
   then return('procname(args)');
   elif nargs>0
   then
   result:=args[1];
   for i from 2 to nargs do
                    if args[i]>result then    result:=
  args[i] fi od;
   result;
  fi;
  end:
> maxN(9,2,3,4,5.0);
```

9

```
(%i1) for i:1 thru 5 step 1 do display(i)$
```

$$i = 1$$
$$i = 2$$
$$i = 3$$
$$i = 4$$
$$i = 5$$

```
(%i2) for i:2 thru 6 step 2 do print('sum(j^i,j,1,n))$
```

$$\sum_{j=1}^{n} j^2$$

$$\sum_{j=1}^{n} j^4$$

$$\sum_{j=1}^{n} j^6$$

```
(%i3) kill(all);
(%o0) done

(%i1) seznam : [1,2,3,4,5];
(%o1) [1,2,3,4,5]

(%i2) s:0;
(%o2) 0

(%i3) for i in seznam do if remainder(seznam[i],2)=0 then
      s:s+seznam[i]^2;
(%o3) done

(%i4) print("soucet ctvercu s = ", s);
soucet ctvercu s =  20
(%o4) 20

(%i5) x : 256;
(%o5) 256
```

```
(%i6) while x>1 do x: x/4;
(%o6) done
```

```
(%i7) x;
(%o7) 1
```

```
(%i8) a:20$ b:12$
      while notequal(b,0) do (
       d:remainder(a,b),
       a:b,
       b:d)$
```

```
(%i11) print("celociselny NSD je", a);
celociselny NSD je 4
(%o11) 4
```

```
(%i12) kill(all);
(%o0) done
```

```
(%i1) euklid(a,b):=
       block([],local(d),d:remainder(a,b),
       while notequal(d,0) do
       (a:b, b:d, d:remainder(a,b)), b);
(%o1) euklid(a,b):=block([],local(d),d:remainder(a,b),while
notequal(d,0) do (a:b,b:d,d:remainder(a,b)),b)
```

```
(%i2) euklid(20,12);
(%o2) 4
```

```
(%i3) for i: 3 step 2 do
      if primep(2^i-1)
      then print(2^i-1, "je prvocislo")
      else return(2^i-1);
7 je prvocislo
31 je prvocislo
127 je prvocislo
(%o3) 511
```

```
(%i4) max3(a,b,c) :=
       block([], print("nalezeni maxima z cisel ",a,b,c),
       if a<b then
       if b<c then c else b
       elseif a<c then c
       else a)$
```

```
(%i5) max3(3,2,1);
nalezeni maxima z cisel  3 2 1
(%o5) 3
```

```
(%i6) save("/home_zam/plch/vyuka/maxima/maximum", max3);
(%o6) /home_zam/plch/vyuka/maxima/maximum
```

```
(%i7) kill(all);
(%o0) done
```

```
(%i1) load("/home_zam/plch/vyuka/maxima/maximum");
(%o1) /home_zam/plch/vyuka/maxima/maximum
```

```
(%i2) max3(1,2,3);
nalezeni maxima z cisel  1 2 3
(%o2) 3
```

```
(%i3) kill(max3);
(%o3) done
```

```
(%i4) batch("/home_zam/plch/vyuka/maxima/procedura.mac")$
read and interpret file: /home_zam/plch/vyuka/maxima/procedura.mac
(%i5) max3(a,b,c):=block([],
print(nalezeni maxima z cisel ,a,b,c),if a<b then if b<c then
c else b elseif a<c then c else a)
(%o5) max3(a,b,c):=block([],
print(nalezeni maxima z cisel ,a,b,c),if a<b then if b<c then
c else b elseif a<c then c else a)
```

```
(%i6) max3(2,3,1);
nalezeni maxima z cisel  2 3 1
(%o6) 3
```

```
 -->  maxN([l]):=block([result],
       if length(l)>0
       then
       result:l[1],
       for i:2 thru length(l) do
                     if l[i]>result then
                     result:l[i], return(result))$
```

```
(%i8) maxN(9,2,3,4,5.0);
(%o8) 9
```