```
> with(numtheory);
  [B, F, GIgcd, J, L, M, bernoulli, bigomega, cfrac, cfracpol,
       cyclotomic, divisors, euler, factorEQ, factorset, fermat,
       ifactor, ifactors, imagunit, index, integral_basis, invcfrac,
       invphi, isolve, isprime, issqrfree, ithprime, jacobi,
       kronecker, lambda, legendre, mcombine, mersenne, minkowski,
       mipolys, mlog, mobius, mroot, msqrt, nearestp, nextprime,
       nthconver, nthdenom, nthnumer, nthpow, order, pdexpand, phi,
       pprimroot, prevprime, primroot, quadres, rootsunity,
       safeprime, sigma, sq2factor, sum2sqr, tau, thue]
> p_i:=ithprime(20); #i-edik prim
                              p_i := 71
> primek:=seq(ithprime(n),n=1..10);
              primek := 2, 3, 5, 7, 11, 13, 17, 19, 23, 29
> primeksorozata:=seq([n,ithprime(n)],n=1..10);
  primeksorozata := [1, 2], [2, 3], [3, 5], [4, 7], [5, 11], [6, 13],
       [7, 17], [8, 19], [9, 23], [10, 29]
> isprime(125);
                               false
> primteszt:=seq([n,isprime(n)],n=1..10);
  primteszt := [1, false], [2, true], [3, true], [4, false],
       [5, true], [6, false], [7, true], [8, false], [9, false],
       [10, false]
> nextprime(1000); prevprime(1000);
                              1009
```

```
> osztok:=divisors(12);

                osztok := {1, 2, 3, 4, 6, 12}

> osztokhalmaza:=seq([n,divisors(n)],n=1..20);

  osztokhalmaza := [1, {1}], [2, {1, 2}], [3, {1, 3}], [4, {1, 2, 4}],
       [5, {1, 5}], [6, {1, 2, 3, 6}], [7, {1, 7}],
       [8, {1, 2, 4, 8}], [9, {1, 3, 9}], [10, {1, 2, 5, 10}],
       [11, {1, 11}], [12, {1, 2, 3, 4, 6, 12}], [13, {1, 13}],
       [14, {1, 2, 7, 14}], [15, {1, 3, 5, 15}],
       [16, {1, 2, 4, 8, 16}], [17, {1, 17}],
       [18, {1, 2, 3, 6, 9, 18}], [19, {1, 19}],
       [20, {1, 2, 4, 5, 10, 20}]

> osztokszama:= tau(1000); # osztok szama

                   osztokszama := 16

> osztokszama:=seq([n,tau(n)],n=1..20);

  osztokszama := [1, 1], [2, 2], [3, 2], [4, 3], [5, 2], [6, 4],
       [7, 2], [8, 4], [9, 3], [10, 4], [11, 2], [12, 6], [13, 2],
       [14, 4], [15, 4], [16, 5], [17, 2], [18, 6], [19, 2], [20, 6]

> osztokszama:=seq(tau(n),n=1..20);

  osztokszama :=
       1, 2, 2, 3, 2, 4, 2, 4, 3, 4, 2, 6, 2, 4, 4, 5, 2, 6, 2, 6

> osztokosszege:=sigma(1000);

                   osztokosszege := 2340

> osztokosszege:=seq([n,sigma(n)],n=1..20);

  osztokosszege := [1, 1], [2, 3], [3, 4], [4, 7], [5, 6], [6, 12],
```

```
        [7, 8], [8, 15], [9, 13], [10, 18], [11, 12], [12, 28],
        [13, 14], [14, 24], [15, 24], [16, 31], [17, 18], [18, 39],
        [19, 20], [20, 42]
>  osztokosszege:=seq(sigma(n),n=1..20);
  osztokosszege := 1, 3, 4, 7, 6, 12, 8, 15, 13, 18, 12, 28, 14, 24,
        24, 31, 18, 39, 20, 42
> Eulerfuggveny:=phi(1000);
                        Eulerfuggveny := 400
> Eulerfuggveny:=seq([n,phi(n)],n=1..20);
  Eulerfuggveny := [1, 1], [2, 1], [3, 2], [4, 2], [5, 4], [6, 2],
        [7, 6], [8, 4], [9, 6], [10, 4], [11, 10], [12, 4], [13, 12],
        [14, 6], [15, 8], [16, 8], [17, 16], [18, 6], [19, 18],
        [20, 8]
> Eulerfuggveny:=seq(phi(n),n=1..20);
  Eulerfuggveny := 1, 1, 2, 2, 4, 2, 6, 4, 6, 4, 10, 4, 12, 6, 8, 8,
        16, 6, 18, 8
> Mobiusfuggveny:=seq([n,mobius(n)],n=1..20);
  Mobiusfuggveny := [1, 1], [2, -1], [3, -1], [4, 0], [5, -1], [6, 1],
        [7, -1], [8, 0], [9, 0], [10, 1], [11, -1], [12, 0], [13, -1],
        [14, 1], [15, 1], [16, 0], [17, -1], [18, 0], [19, -1],
        [20, 0]
> Mobiusfuggveny:=seq(mobius(n),n=1..20);
  Mobiusfuggveny := 1, -1, -1, 0, -1, 1, -1, 0, 0, 1, -1, 0, -1, 1, 1,
        0, -1, 0, -1, 0
> negyzetmentes:=issqrfree(30);
```

```
                    negyzetmentes := true

> negyzetmentes := seq([n,issqrfree(n)],n=1..6);

  negyzetmentes := [1, true], [2, true], [3, true], [4, false],

       [5, true], [6, true]

> fermat(n);

                              n
                             (2 )
                            2     + 1

> fermat(5);

                          4294967297

> fermat(7,'w');

              340282366920938463463374607431768211457

> w;

                                9
  it is completely factored ,  ( (2)   (116503103764643) + 1)

             9     5
       ( (2)   (3)   (5)  (733803839347)  (12497) + 1)

> Mersenneprim:=mersenne(31);

                   Mersenneprim := 2147483647

> nedikMersenneprim:= mersenne([10]);

          nedikMersenneprim := 618970019642690137449562111

> Legendreszimbolum:=legendre(74,101);

                    Legendreszimbolum := -1

> lambda(200);  #Carmichael fuggveny

                              20

> lambda(13); lambda(115);

                              12
```

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```
> Kinaimaradektetel:=mcombine(6,5,9,7);
```

Kinaimaradektetel := FAIL

```
> mcombine(7,4,11,5);
```

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```
> egeszmegoldas:=isolve(14*x+3*y=7);
```

egeszmegoldas := {y = -7 - 14 _N1, x = 2 + 3 _N1}

```
> solve(5*x^2-20=0);
```

2, -2

```
>
```