

```
> a := 3*x^3-5*x*y^4+7*x*y;
```

$$a := -5xy^4 + 3x^3 + 7xy \quad (1)$$

```
> dismantle(a);
```

POLY(8)
 EXPSEQ(3)
 NAME(4): x
 NAME(4): y
 DEGREES(HW): ^5 ^1 ^4
 INTNEG(2): -5
 DEGREES(HW): ^3 ^3 ^0
 INTPOS(2): 3
 DEGREES(HW): ^2 ^1 ^1
 INTPOS(2): 7

```
> b := 3*x+5*y+7*z;
```

$$b := 3x + 5y + 7z \quad (2)$$

```
> dismantle(b);
```

SUM(7)
 NAME(4): x
 INTPOS(2): 3
 NAME(4): y
 INTPOS(2): 5
 NAME(4): z
 INTPOS(2): 7

```
> a;
```

$$-5xy^4 + 3x^3 + 7xy \quad (3)$$

```
> degree(a);
```

$$5 \quad (4)$$

```
> lc := lcoeff(a,[x,y,z], 'lm');
```

$$lc := 3 \quad (5)$$

```
> lm;
```

$$x^3 \quad (6)$$

```
> lcoeff(a,order=grlex(x,y,z), 'lm');
```

$$-5 \quad (7)$$

```
> lm;
```

$$xy^4 \quad (8)$$

```
> lcoeff(a,order=plex(x,y,z), 'lm');
```

$$3 \quad (9)$$

```
> lm;
```

$$x^3 \quad (10)$$

```
> LT := proc(a) local lc,lm;
  lc := lcoeff(a,order=grlex(x,y,z), 'lm');
  lc*lm;
end;
```

```
> LT(a);
```

$$-5xy^4 \quad (11)$$

```
=
> DIV := proc(a,b,LT) local q,r,A,lb,la,t,i;
  q,r := 0,0;
  A := a;
  lb := LT(b);
  i := 0;
  while A <> 0 and i<100 do
    la := LT(A);
    t := la/lb;
    if type(t,polynomial) then
      q := q+t;
      A := A-expand(t*b);
    else r := r+la;
      A := A-la;
    fi;
    i++;
  od;
  q,r;
end:
```

```
> q := 3*x*y*z+2*x^2;
```

$$q := 3xyz + 2x^2 \quad (12)$$

```
> b := x*y^2+3*z;
```

$$b := xy^2 + 3z \quad (13)$$

```
> r := -4*x*y*z^4;
```

$$r := -4xyz^4 \quad (14)$$

```
> a := expand( q*b+r );
```

$$a := 3x^2y^3z - 4xyz^4 + 2x^3y^2 + 9xyz^2 + 6x^2z \quad (15)$$

```
> DIV(a,b,LT);
```

$$3xyz + 2x^2, -4xyz^4 \quad (16)$$

```
=
> LT := proc(a) local lc,lm;
  lc := lcoeff(a,order=plex(x,y,z), 'lm');
  lc*lm;
end:
```

```
> DIV(a,b,LT);
```

$$3xyz + 2x^2, -4xyz^4 \quad (17)$$