```
> f := 2*x^3*y^2-y^3+1;
```

$$f := 2\,x^3\,y^2 - y^3 + 1$$

```
> LTlex := proc(f) local c,m;
    c := lcoeff(f,order=plex(X),'m'); c*m;
  end:
> X := x,y;
```

$$X := x,\ y$$

```
> LTlex(f);
```

$$2\,x^3\,y^2$$

```
> divide( x^2, x ); # test if x | x^2
```

$$true$$

```
> DivAlg := proc(f,F::list,LT::procedure)
  local p,r,s,q,divoccurred,i,g,t;
    (p,r) := (f,0);
    s := nops(F);
    q := Array(1..s); # Arrays are automatically initialized to 0
    while p <> 0 do
      divoccurred := false;
      for i from 1 to s while not divoccurred do
          if divide(LT(p),LT(F[i])) then # if LT(F[i])|LT(p) then
              t := LT(p)/LT(F[i]);
               q[i] := q[i] + t;
              p := expand( p - t*F[i] );
             divoccurred := true;
            fi;
       end do;
      if not divoccurred then r := r+LT(p); p := p-LT(p); fi;
    end do;
     q,r;
  end:
> F := [x*y^2-x,x-y^2];
```

$$F := [x\,y^2 - x,\ -y^2 + x]$$

```
> a,r := DivAlg( f, F, LTlex );
```

$$a,\ r := \left[\ 2\,x^2 + 2\,x + 2 \quad 2\,x^2 + 2\,x + 2\ \right],\ -y^3 + 2\,y^2 + 1$$

```
> expand( f-a[1]*F[1]-a[2]*F[2]-r );
```

$$0$$

```
> Groebner[NormalForm](f,F,plex(x,y));
```

$$-y^3 + 2\,y^2 + 1$$

```
> LTgrlex := proc(f) local c,m;
    c := lcoeff(f,order=grlex(X),'m'); c*m;
  end:
> DivAlg( f, F, LTgrlex );
```

$$\left[\ 2\,x^2 \quad y\ \right],\ 2\,x^3 - x\,y + 1$$