```
> S1 := [x^2+y^2=1,x+y=0];
```

$$S1 := \left[x^2 + y^2 = 1,\, x + y = 0 \right]$$

```
> with(plots):
> implicitplot( S1, x=-2..2, y=-2..2, grid=[100,100] );
```
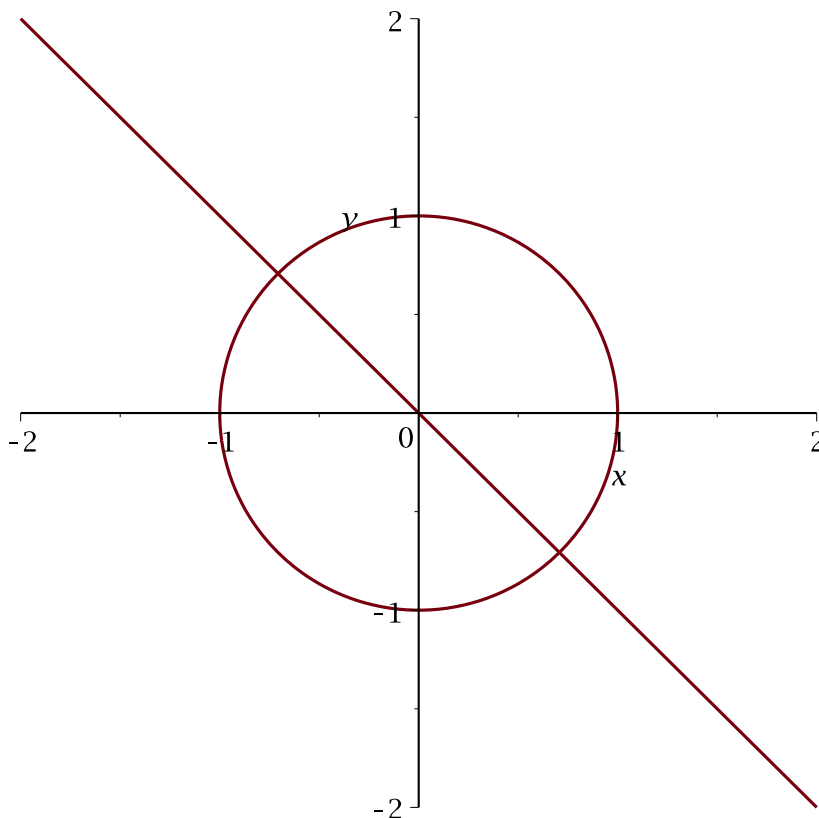


```
> _EnvExplicit := true;
  solve( S1, {x,y} );
```

$$\_EnvExplicit := true$$

$$\left\{ x = -\frac{1}{2}\sqrt{2},\, y = \frac{1}{2}\sqrt{2} \right\},\ \left\{ x = \frac{1}{2}\sqrt{2},\, y = -\frac{1}{2}\sqrt{2} \right\}$$

```
> S2 := [z=x*y,y=x^2];
```

$$S2 := \left[z = x\,y,\, y = x^2 \right]$$

```
> P1 := implicitplot3d( S2, x=-2..2, y=-2..2, z=-2..2, color=[red,blue],
  style=patchcontour );
```

$$P1 := PLOT3D(\ldots)$$

```
> solve( S2, {x,y,z} );
```
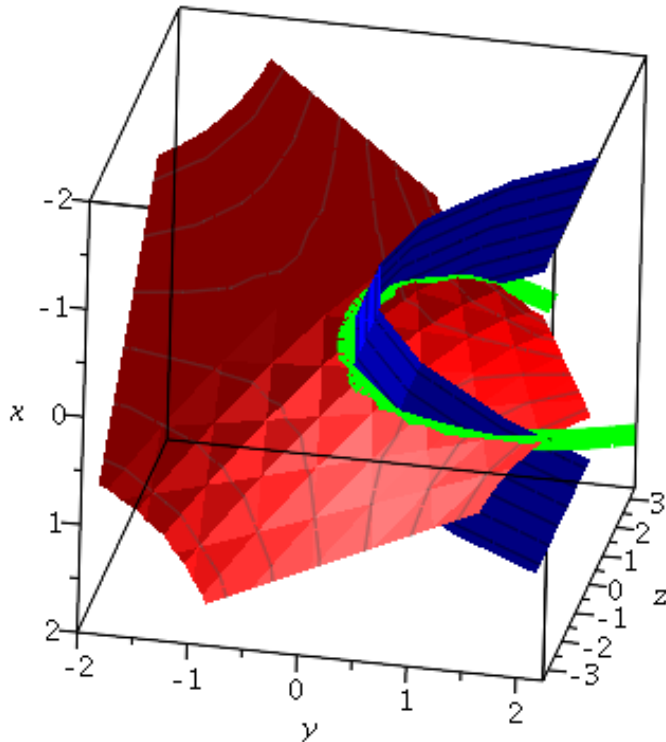
$$\{ x = x,\, y = x^2,\, z = x^3 \}$$

```
> P2 := spacecurve( [t,t^2,t^3], t=-1.5..1.5, color=green, thickness=10
  );
```

$$P2 := PLOT3D(\ldots)$$

```
> display([P1,P2]);
```



```
> S1;
```
$$[x^2 + y^2 = 1,\; x + y = 0]$$

```
> G1 := Groebner[Basis]( S1, plex(x,y) );
```
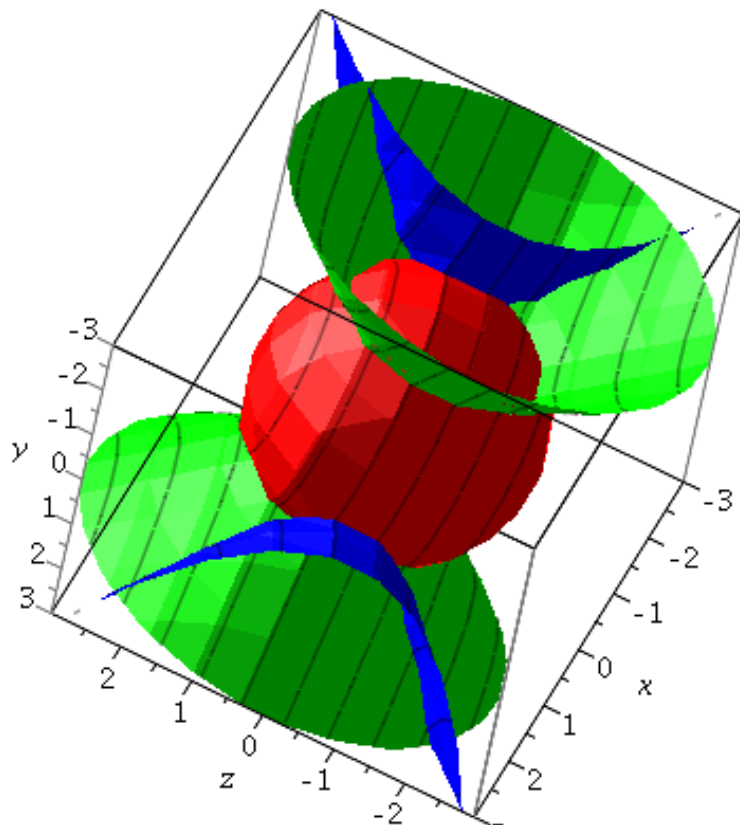$$G1 := [2\,y^2 - 1,\; x + y]$$

```
> S1 := [x^2+y^2-1, x+y];
```
$$S1 := [x^2 + y^2 - 1,\; x + y]$$

```
> S3 := [x^2+y^2+z^2-4, x^2-y^2-z^2, x*y-z^2-1];
```
$$S3 := [x^2 + y^2 + z^2 - 4,\; x^2 - y^2 - z^2,\; x\,y - z^2 - 1]$$

```
> implicitplot3d( S3, x=-3..3, y=-3..3, z=-3..3, color=[red,green,blue],
  style=patchcontour );
```

> **G2 := Groebner[Basis](S3, plex(x,y,z));**
$$G2 := [z^4 + 4z^2 - 3, y^2 + z^2 - 2, -yz^2 + 3x - 3y]$$

> **G2[1];**
$$z^4 + 4z^2 - 3$$

> **factor(G2[1]);**
$$z^4 + 4z^2 - 3$$

> **sols := solve(G2[1] = 0, z);**
$$sols := \mathrm{I}\sqrt{2 + \sqrt{7}}, -\mathrm{I}\sqrt{2 + \sqrt{7}}, \sqrt{-2 + \sqrt{7}}, -\sqrt{-2 + \sqrt{7}}$$

> **evalf(sols);**
$$2.155400499\,\mathrm{I}, -2.155400499\,\mathrm{I}, 0.8035865299, -0.8035865299$$