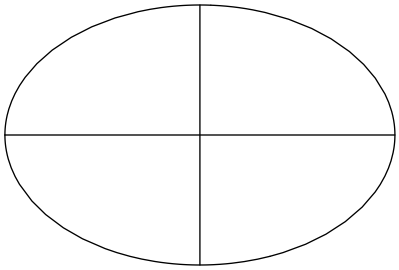
Plot−Befehle in Mathematica am Beispiel der Ellipse

■ Plot der Kurve in Parameterform

```
In[4]:= a = 3; b = 2;

In[1]:= c[t_] := {a Cos[t], b Sin[t]}

In[6]:= ParametricPlot[c[t], {t, -π, π},
         AspectRatio → Automatic, Axes → False,
         Epilog → {Line[{{-a, 0}, {a, 0}}], Line[{{0, -b}, {0, b}}]}]
```



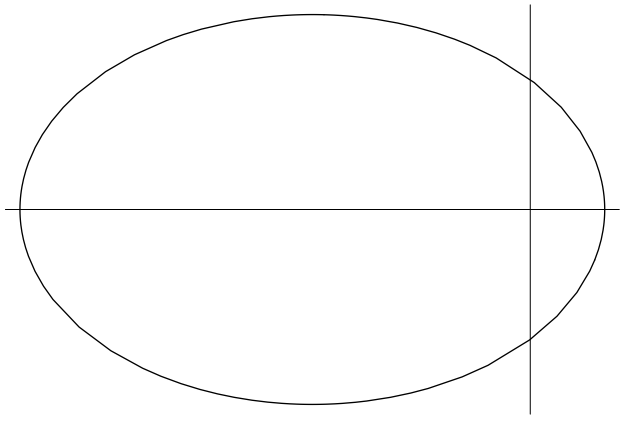
```
Out[6]= - Graphics -
```

■ Plot der Kurve in Polarkoordinaten

```
In[15]:= e := Sqrt[a^2 - b^2]
         ϵ := e / a
         r[ϕ_] := 1 / (1 + ϵ Cos[ϕ])

In[8]:= << Graphics`Graphics`

In[19]:= PolarPlot[r[ϕ], {ϕ, -π, π}, AspectRatio → Automatic, Ticks → False]
```



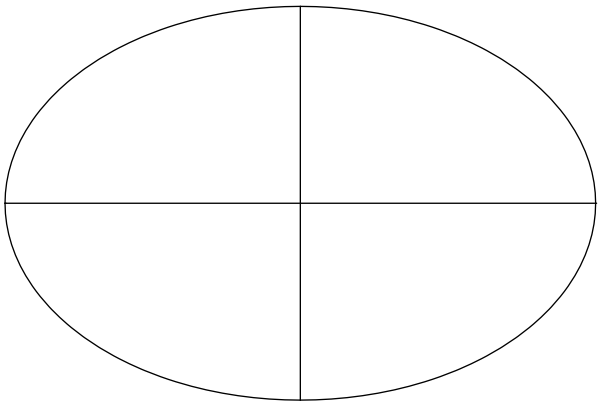
```
Out[19]= - Graphics -
```

■ Plot der implizit gegebenen Kurve

In[20]:=
```
<< Graphics`ImplicitPlot`
```

In[25]:=
```
F[x_, y_] := (x / a) ^2 + (y / b) ^2
```

In[26]:=
```
ImplicitPlot[ F[x, y] == 1, {x, -a, a}, {y, -b, b}, Axes → False,
  AspectRatio → Automatic, Epilog → {Line[{{-a, 0}, {a, 0}}], Line[{{0, -b}, {0, b}}]}]
```



Out[26]= - ContourGraphics -

■ Plot der explizit gegeben Kurve

In[42]:=
```
Clear[a, b]
```

In[49]:=
```
sol = Solve[F[x, y] == 1, {y}]
```

Out[49]=
$$\left\{\left\{y \to -\sqrt{b^2 - \frac{b^2\, x^2}{a^2}}\right\}, \left\{y \to \sqrt{b^2 - \frac{b^2\, x^2}{a^2}}\right\}\right\}$$

In[50]:=
```
f1 = Function[x, y /. sol[[1]]]
f2 = Function[x, y /. sol[[2]]]
```

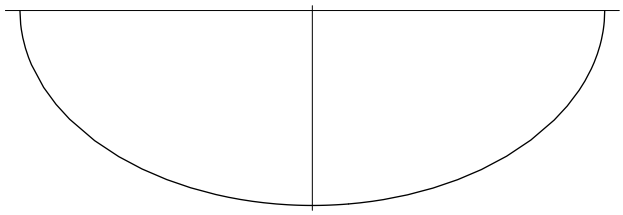
Out[50]= Function[x, y /. sol〚1〛]

Out[51]= Function[x, y /. sol〚2〛]

In[52]:=
```
f1[x]
```

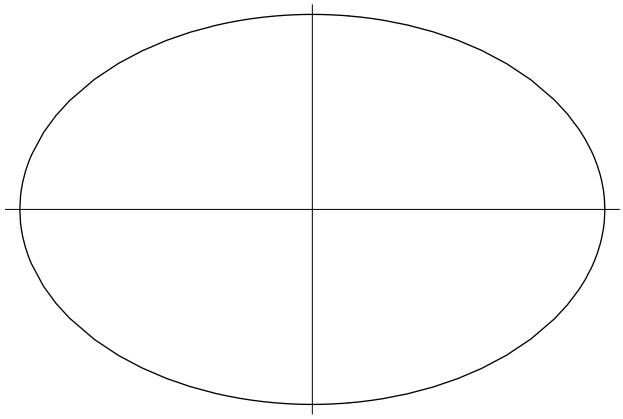
Out[52]=
$$-\sqrt{b^2 - \frac{b^2\, x^2}{a^2}}$$

In[53]:=
```
a = 3; b = 2;
Plot[f1[x], {x, -a, a}, AspectRatio → Automatic, Ticks → None]
```



Out[54]= - Graphics -

In[55]:=
```
Plot[{f1[x], f2[x]}, {x, -a, a}, AspectRatio → Automatic, Ticks → None]
```



Out[55]= - Graphics -