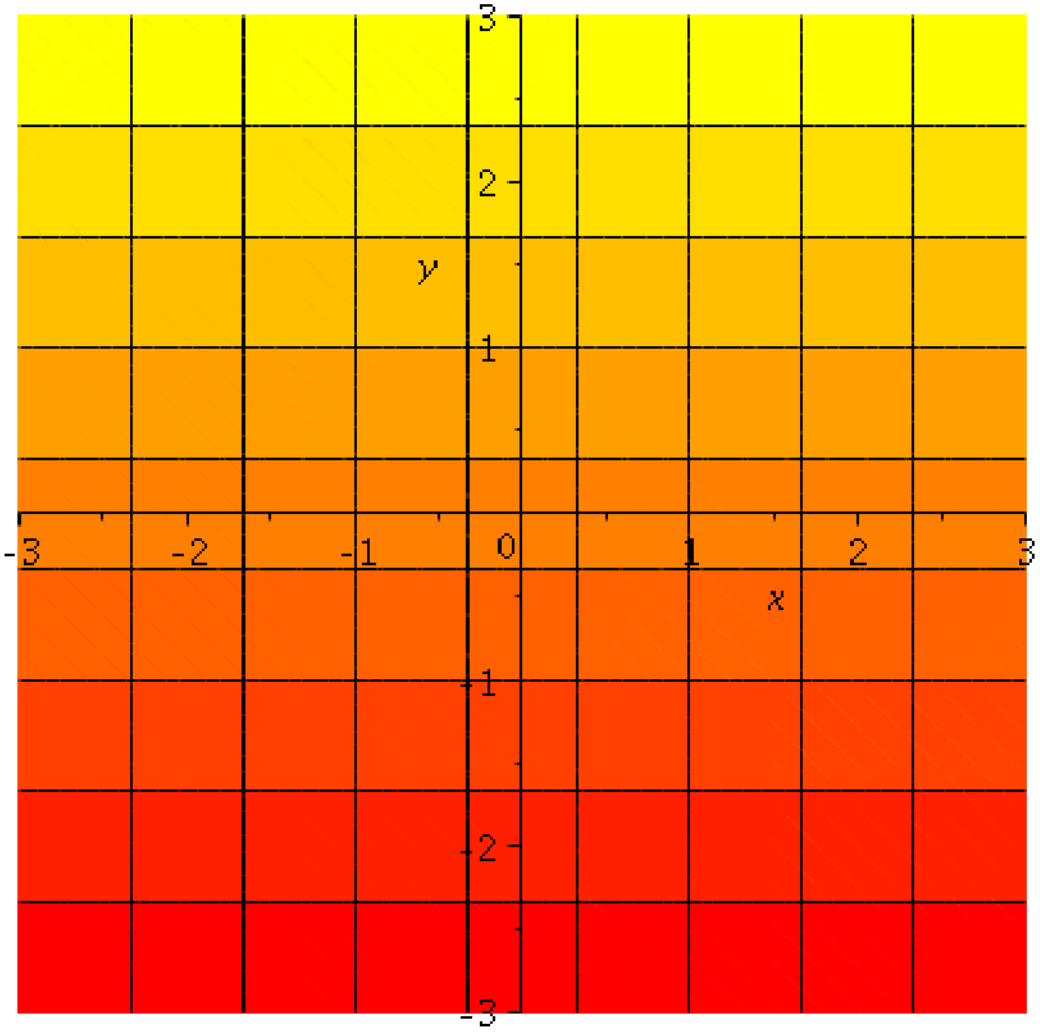
```
> with(plottools) : with(plots) :
```

Rectangular coordinates.

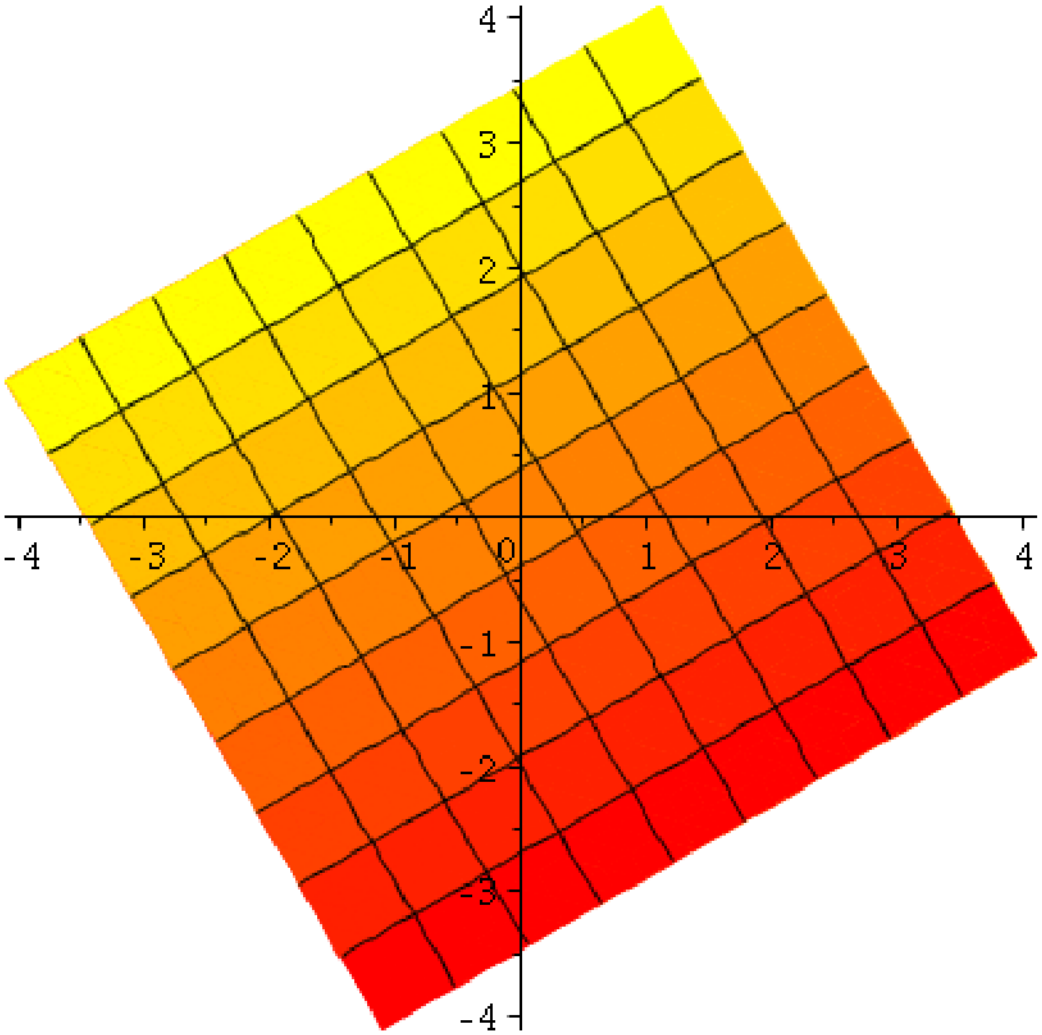
```
>
  qx := contourplot(x, x = -3 ..3, y = -3 ..3, filled = true) : qy := contourplot(y, x = -3
      ..3, y = -3 ..3, filled = true) : display({qx, qy});
```



Rotation by pi/6

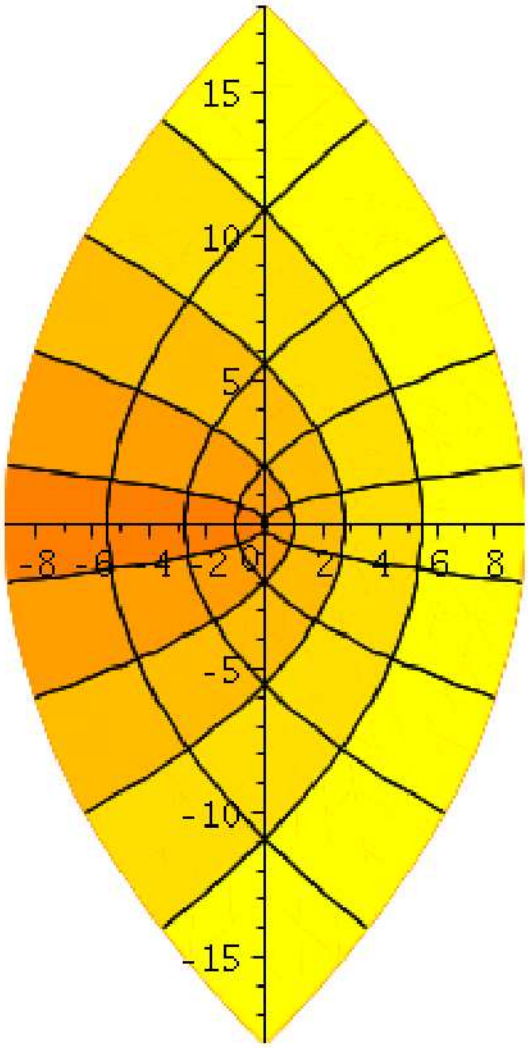
> $f := transform\left((x, y) \rightarrow \left[x\cos\left(\frac{\pi}{6}\right) - y\sin\left(\frac{\pi}{6}\right), x\sin\left(\frac{\pi}{6}\right) + y\cos\left(\frac{\pi}{6}\right) \right] \right)$:

$display(\{f(qx), f(qy)\})$;



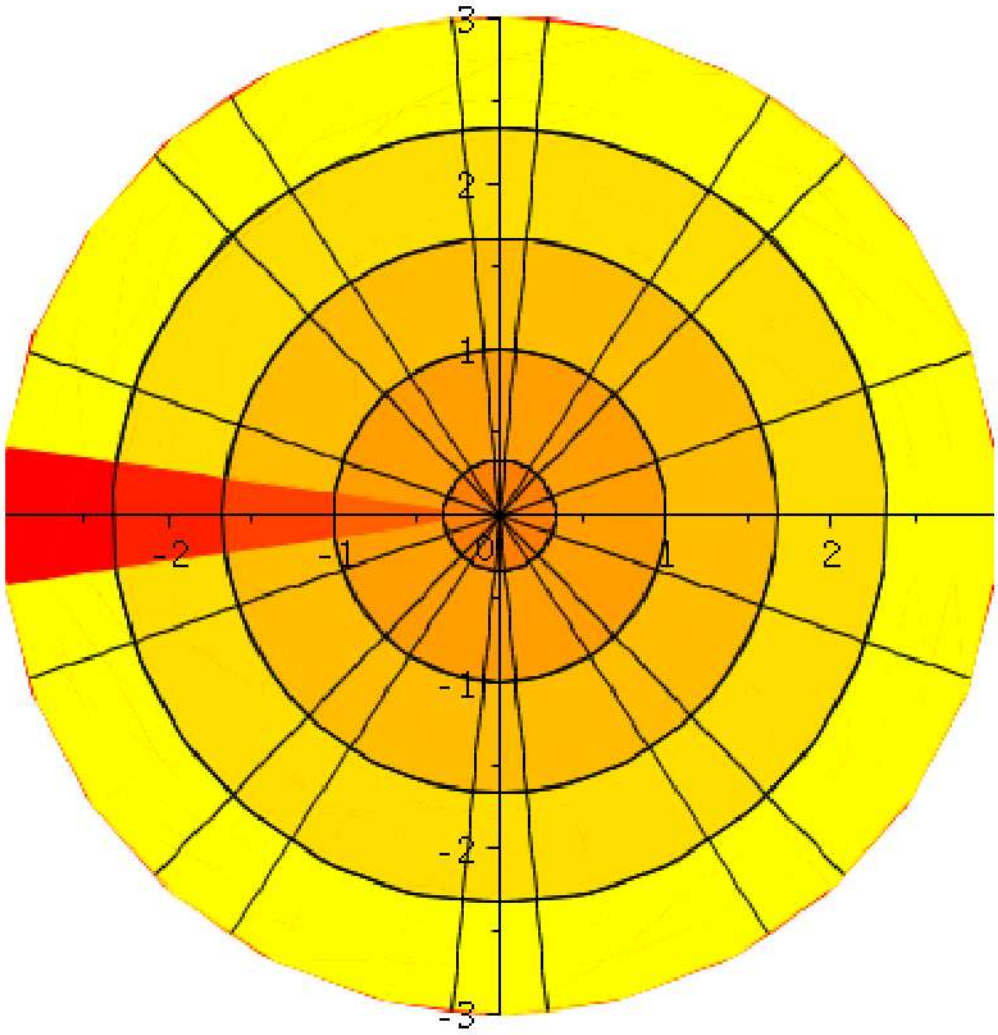
The transformation $[x^2 - y^2, 2\,x\,y]$

```
> fz2 := transform( (x, y) → [x^2 - y^2, 2 x y]) : display( {fz2(qx), fz2(qy)}, scaling
      = constrained);
```



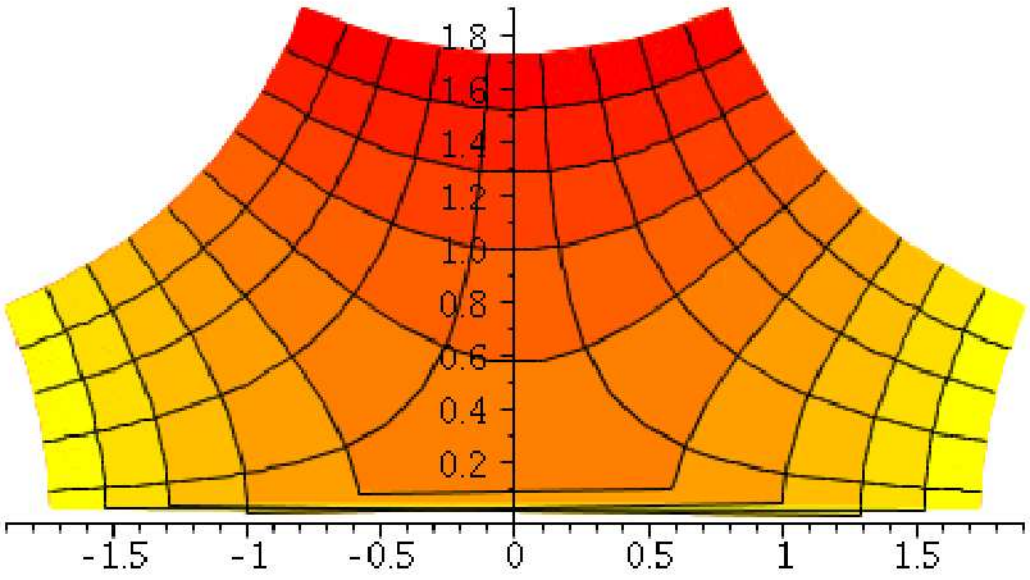
Polar coordinate transformation

```
> fpol := transform((x, y) → [x cos(y), x sin(y)]) :
  display({fpol(qx), fpol(qy)}, scaling = constrained)
```



Inverse of map in the book.

```
> solve({x^2 - y^2 = u, 2 x y = v}, {x, y}) :
  fi1 := transform((x, y) -> [1 y / (2 RootOf(-y^2 + 4 _Z^4 + 4 x _Z^2)), RootOf(-y^2 + 4 _Z^4
      + 4 x _Z^2)]) : display({fi1(qx), fi1(qy)}, scaling = constrained);
```



Inverse of polar coordinates.

```
> solve({u*cos(v) = x, u*sin(v) = y}, {u, v}):
  fi2 := transform((x, y) -> [1/RootOf((y^2 + x^2)*_Z^2 - 1), arctan(RootOf((y^2
      + x^2)*_Z^2 - 1)*y, RootOf((y^2 + x^2)*_Z^2 - 1)*x)]):
  display({fi2(qx), fi2(qy)}, scaling = constrained)
```