```
(* :Title: MappaComplessa4  *)
(* :Context: MappaComplessa4`  *)
(* :Author: GS *)
(* :Summary: a version of the ComplexMap package *)
(* :Copyright:  *)
(* :Package Version: 1, Aprile 2020  *)
(* :Mathematica Version:  12  *)
(* :History: *)
(* :Sources: *)
(* :Limitations: *)
(* :Discussion: *)
```

```
BeginPackage["MappaComplessa4` "]

CartesianMap::usage = "CartesianMap[f, {x0, x1, (dx)}, {y0, y1, (dy)}]
    plots the image of the cartesian coordinate lines under the function f.
    The default values of dx and dy are chosen so that the number of lines
    is equal to the value of the option PlotPoints of Plot[ ]."

PolarMap::usage = "PolarMap[f, {r0:0, r1, (dr)}, {p0, p1, (dp)}]
    plots the image of the polar coordinate lines under the function f.
    The default values of dr and dp are chosen so that the number of lines
    is equal to the value of the option PlotPoints of Plot[ ]."
```

```
Begin["`Private` "]
```

```
CartesianMap[ func_, {x0_, x1_, dx_:Automatic}, {y0_, y1_, dy_:Automatic}, opts___] :=
    Module[ {x,y,coords,plotpoints, ndx=dx, ndy=dy},

        plotpoints= PlotPoints/.Options[Plot];

If[ dx===Automatic, ndx=(x1-x0)/(plotpoints-1)] ;
If[ dy===Automatic, ndy=(y1-y0)/(plotpoints-1)] ;

coords = Table[  N[ func[ x+I y]], {x,x0,x1,ndx},{y,y0,y1,ndy}];

Show[MakeLines[coords], opts, AspectRatio->Automatic, Axes->Automatic]
    ]
```

```
PolarMap[ func_, {r0_:0, r1_, dr_:Automatic}, {p0_, p1_, dp_:Automatic} ,opts___] :=
    Module[ {r,p,coords ,plotpoints , ndr=dr, ndp=dp},
        plotpoints = PlotPoints /.Options[Plot];

If[ dr===Automatic , ndr=(r1-r0)/(plotpoints -1) ];
If[ dp===Automatic , ndp=(p1-p0)/(plotpoints -1) ];

coords = Table[  N[ func[ r   Exp[  I  p] ] ], {r,r0,r1,ndr},{p,p0,p1,ndp}];

Show[MakeLines[coords], opts , AspectRatio ->Automatic , Axes->Automatic]
    ]
```

```
(* auxiliary function *)
MakeLines[points_] :=
    Module[ {coords , lines},

        coords = Map[ {Re[#], Im[#]}& , points , {2} ] ;

        lines = Map[ Line , Join[ coords , Transpose[coords] ] ] ;

        Graphics[ lines ]
    ]
```

```
End[ ]
```

```
EndPackage[ ]
```