Conformal Maps in Cartesian Coordinates

The function “visual” in Cartesian coordinates is called visual[function,xmin,xmax,ymin,ymax]

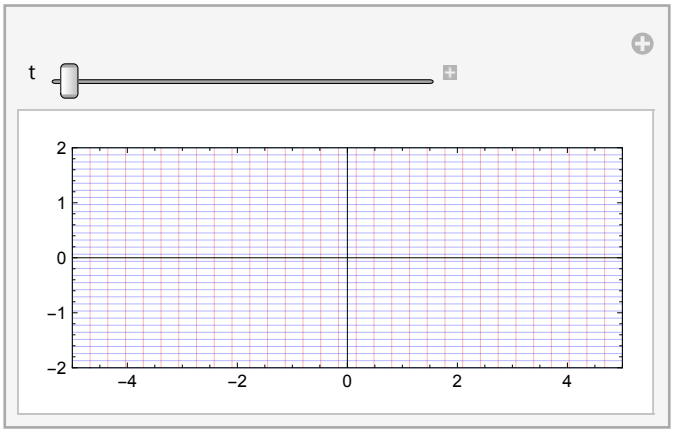
In[46]:=

```
ClearAll["Global`*"];
visual[f0_, xrange1_, xrange2_, yrange1_, yrange2_] :=
 Module[{f = f0, xmin = xrange1, xmax = xrange2, ymin = yrange1, ymax = yrange2},
  z = x + I * y;
  u = ComplexExpand[Re[f]];
  v = ComplexExpand[Im[f]];

  Manipulate[ParametricPlot[{x (1 - t) + t * u, y (1 - t) + t * v},
    {x, xmin, xmax}, {y, ymin, ymax}, PlotRange → {{xmin, xmax}, {ymin, ymax}},
    Mesh → 30, MeshStyle → {Red, Blue}, MeshFunctions → {#3 &, #4 &},
    MeshShading → {{None, None}, {None, None}}, ImageSize → 300], {t, 0, 1}]

 ]
visual[z^2, -5, 5, -2, 2]
```

Out[48]=



Conformal Maps in Polar Coordinates

The function “visual” in Polar coordinates is called as:

visual[function,radiusmin,radiusmax,anglemin,anglemax]

In[43]:=

```
ClearAll["Global`*"];
visual[f0_, xrange1_, xrange2_, yrange1_, yrange2_] :=
 Module[{f = f0, xmin = xrange1, xmax = xrange2, ymin = yrange1, ymax = yrange2},
  u = ComplexExpand[Re[f]];
  v = ComplexExpand[Im[f]];

  Manipulate[



   Quiet[ParametricPlot[{r * Cos[θ] * (1 - t) + t * u, r * Sin[θ] * (1 - t) + t * v},
     {r, 0, xmax}, {θ, ymin, ymax}, PlotRange → {{-xmax, xmax}, {ymin, ymax}},
     Mesh → 20, MeshStyle → {Red, Blue}, MeshFunctions → {#3 &, #4 &},
     MeshShading → {{None, None}, {None, None}}, ImageSize → 300]], {t, 0, 1}



  ]
 ]
visual[1/2 * (r * E^(I*θ) + 1/r * E^(-I*θ)), 0, 1, -π, π]
```