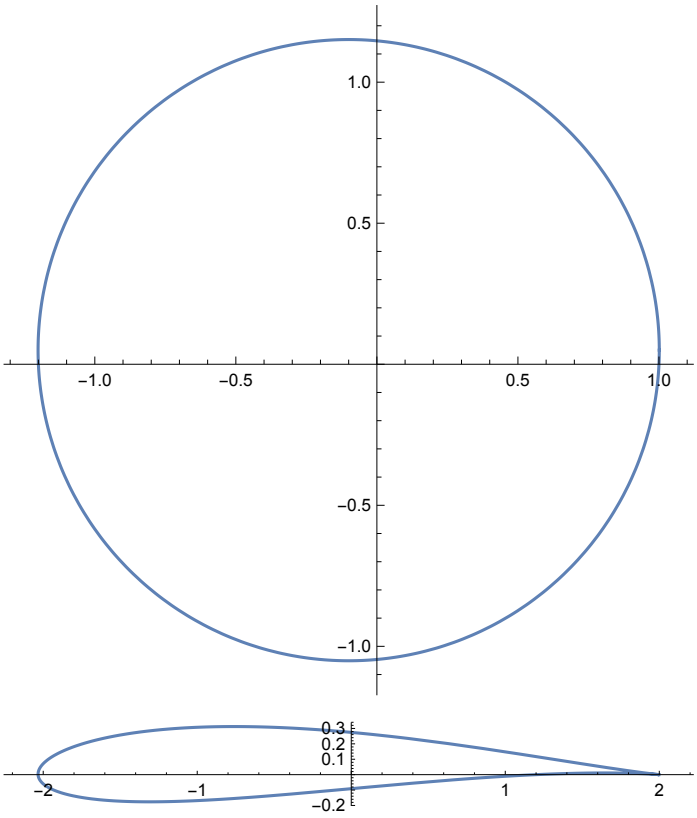
```
(* Vinicio Haro, HW#3: Drawing the Airfoil, STAT 786 *)
(* ParametricPlot[{Cos[u],Sin[u]},{u,0,2Pi}] *)
dx = -.1;
dy = 0.05;
(* Define distance *)
d = (Sqrt[(1 - dx)^2 + (0 - dy)^2]);

ParametricPlot [{(d * Cos[u] - .1), (d * Sin[u] + .05)}, {u, 0, 2 Pi}]
(* Air Foil *)
f[x_, y_] = {(x + x / (x^2 + y^2)) , (y - y / (x^2 + y^2))};
foilplot = ParametricPlot [f[d * Cos[u] - .1, d * Sin[u] + .05], {u, 0, 2 Pi}]

g[z_] =
  (((z + Sqrt[z^2 - 4] - 2 (dx + I * dy)) / (2 * d)) + ((2 * d) / (z + Sqrt[z^2 - 4] - 2 (dx + I * dy))));
h[z_] = (((z - Sqrt[z^2 - 4] - 2 (dx + I * dy)) / (2 d)) + ((2 d) / (z - Sqrt[z^2 - 4] - 2 (dx + I * dy))));
FindRoot[Im[h[-3 + I * y]] == .25, {y, 0}]  (*Finding one point*)
```

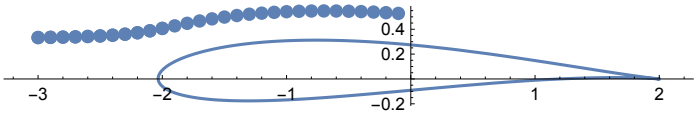


$\{y \to 0.333324\}$

```
airlist = {};
guess = 0;
```

```
For [ i = 0, i ≤ 29 , i++,
 foilpoints = y /. FindRoot[Im[h[-3 + i * .1 + I * y]] == .25, {y, guess}] ;
 guess = foilpoints;
 AppendTo[airlist, {-3 + i * .1 , foilpoints}];
]
For [ i = 0, i ≤ 29 , i++,
 foilpoints = y /. FindRoot[Im[g[3 + i * .1 + I * y]] == .25, {y, guess}] ;
 guess = foilpoints;
 AppendTo[airlist, {3 + i * .1 , foilpoints}];
]
```

```
Show[foilplot, secondarylist, PlotRange → All ]
```

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foilpoints
```

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0.406715
```
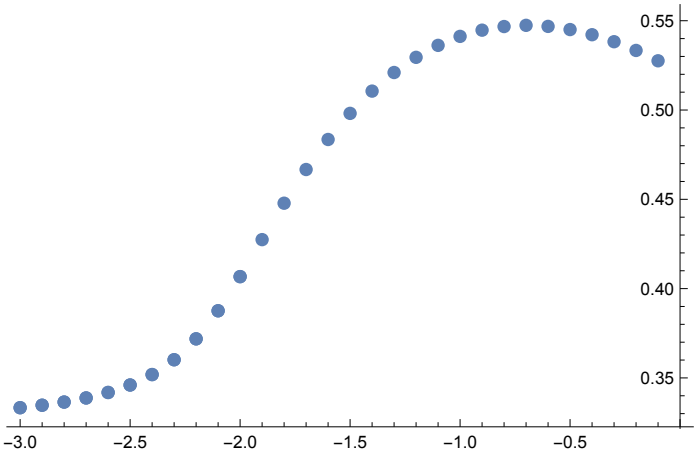

```
secondarylist = ListPlot[airlist]
```




```
(* I'm not sure how to code the B spline formula B(t)=
 (1-t)^2 B1 + 3t(1-t)^2 B2 + 3t^2(1-t)B3 + t^3 B4 *)
```