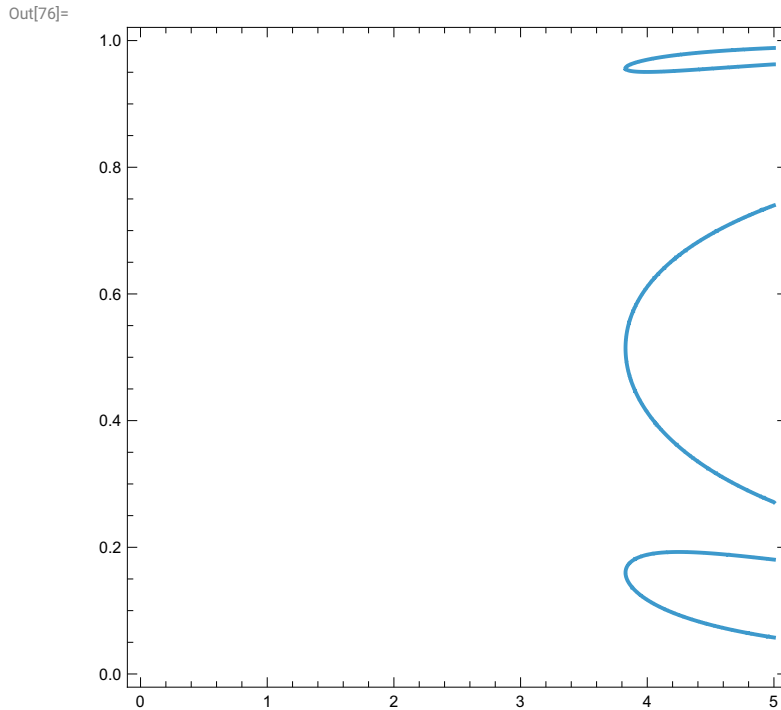


```
In[66]:= f[x_] := a * x * (1 - x);
g[x_] := f[f[x]];
r = (g[x] - x) / (f[x] - x) // Expand // FullSimplify
```

```
Out[68]:= 1 + a (-1 + x) (-1 + a x) (1 + a (1 + a (-1 + x) x) (1 + a (-1 + x) (-1 + a x)))
```

```
In[76]:= ContourPlot[r == 0, {a, 0, 5}, {x, 0, 1}, PlotPoints -> 1000]
```



```
In[45]:= rx = D[r, x] // FullSimplify
```

```
Out[45]:= a (-1 + a (2 (-1 + x) +
a (-2 - 3 (-2 + x) x + 3 a^3 (-1 + x)^2 x^2 (-1 + 2 x) + a (-1 + x)^2 (-1 + 4 x) - a^2 (-1 + x) x (4 + x (-11 + 5 x))))))
```

```
In[50]:= NSolve[{r == 0, rx == 0}, {a, x}, Reals]
```

```
Out[50]:= {{x -> 0.514355, a -> 3.82843}, {x -> 0.159929, a -> 3.82843},
{x -> -0.455455, a -> -1.82843}, {x -> 0.469942, a -> -1.82843}, {x -> 1.21205, a -> -1.82843}}
```

```
In[51]:= Solve[{r == 0, rx == 0}, {a, x}, Reals]
```

```
Out[51]:= {{a -> 1 - 2 Sqrt[2], x -> -0.455...}, {a -> 1 - 2 Sqrt[2], x -> 0.470...}, {a -> 1 - 2 Sqrt[2], x -> 1.21...},
{a -> 1 + 2 Sqrt[2], x -> 0.160...}, {a -> 1 + 2 Sqrt[2], x -> 0.514...}, {a -> 1 + 2 Sqrt[2], x -> 0.956...}}
```

```
In[52]:= Solve[{r == 0, rx == 0}, {a, x}, Reals] // N
```

```
Out[52]:= {{a -> -1.82843, x -> -0.455455}, {a -> -1.82843, x -> 0.469942}, {a -> -1.82843, x -> 1.21205},
{a -> 3.82843, x -> 0.159929}, {a -> 3.82843, x -> 0.514355}, {a -> 3.82843, x -> 0.956318}}
```