

# Addendum Figures for Berry's Construction

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March 2018

## ■ Figure 12a

$$r[n_] := \sqrt{2\pi \left(n - \frac{1}{8}\right)}$$

$$th[n_] := \frac{\pi}{4} + \frac{\text{Log}\left[r[n] \sqrt{2\pi}\right]}{2 r[n]^2}$$

$$z[n_] := r[n] \text{Exp}\left[i th[n]\right]$$

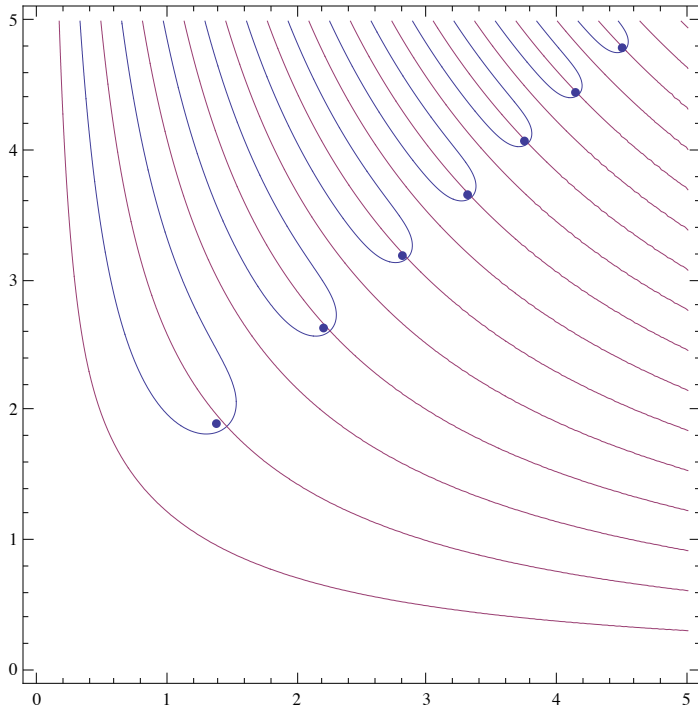
```
N[Table[{n, z[n]}, {n, 1, 7}]] // TableForm
```

1. 1.37061+ 1.90242 i
2. 2.19553+ 2.6383 i
3. 2.80223+ 3.19557 i
4. 3.30429+ 3.66456 i
5. 3.74191+ 4.07782 i
6. 4.13479+ 4.45166 i
7. 4.49428+ 4.79566 i

```
BerryZeros = ListPlot[{{1.37061, 1.90242}, {2.19553, 2.6383}, {2.80223, 3.19557},  
  {3.30429, 3.66456}, {3.74191, 4.07782}, {4.13479, 4.45166}, {4.49428, 4.79566}},  
  PlotRange -> {{0, 5}, {0, 5}}, PlotStyle -> {PointSize[0.013]}];
```

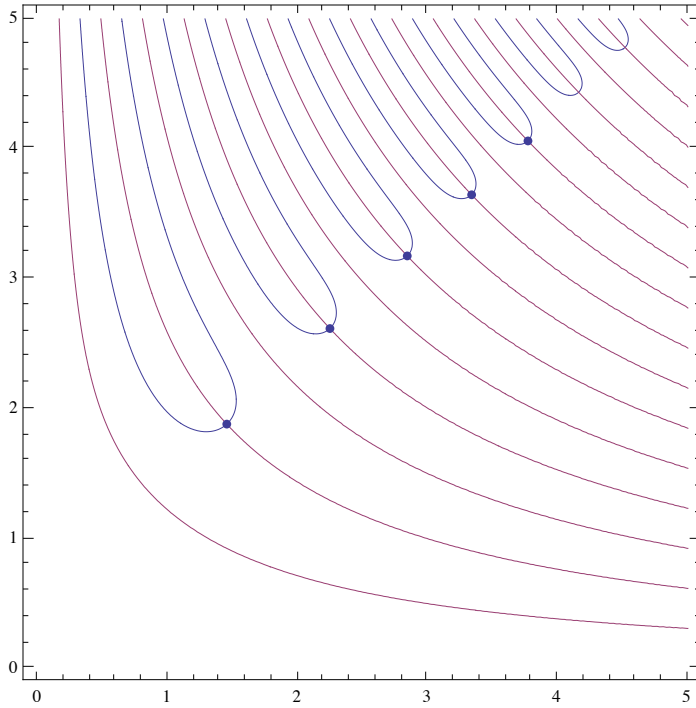
```
NullCurves = ContourPlot[  
  {Re[Erf[x + i y]] == 0, Im[Erf[x + i y]] == 0}, {x, 0, 5}, {y, 0, 5}, PlotPoints -> 50];
```

```
Show[NullCurves, BerryZeros]
```



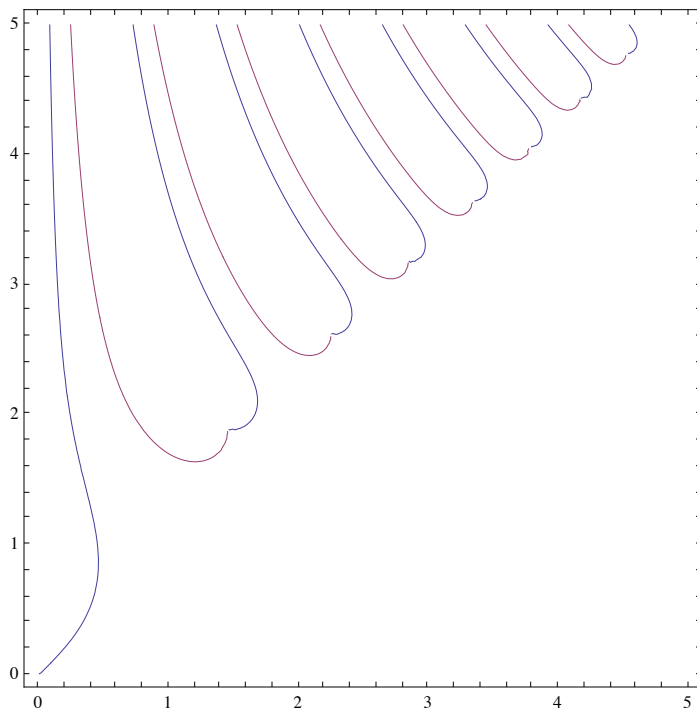
## ■ Figure 12b

```
ExactZeros =  
ListPlot[{{1.45062, 1.88094}, {2.24466, 2.61658}, {2.83974, 3.17563}, {3.33546, 3.64617},  
          {3.76901, 4.06070}}, PlotRange -> {{0, 5}, {0, 5}}, PlotStyle -> {PointSize[0.013]}];  
Show[NullCurves, ExactZeros]
```

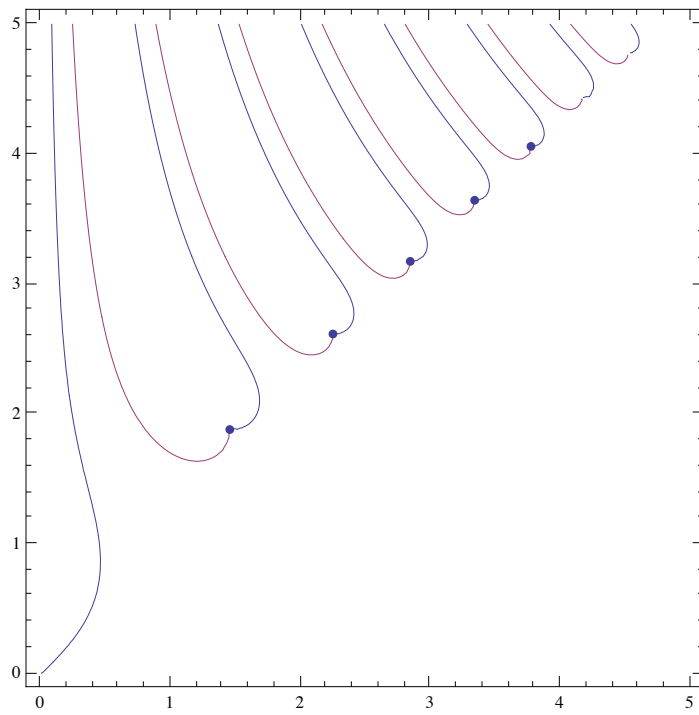


## ■ Figure 13a

antiStokes =

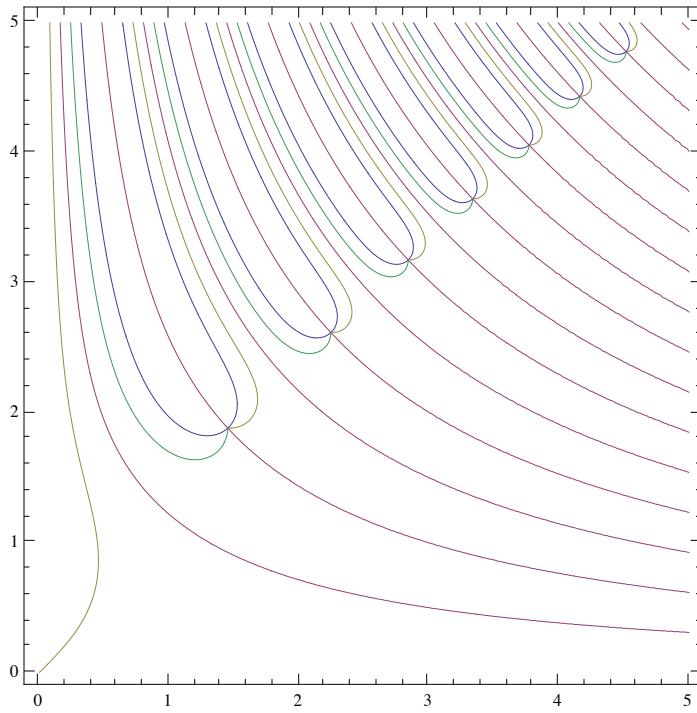
$$\text{ContourPlot}\left[\left\{\text{Arg}\left[\text{N}\left[\text{Erf}\left[x + \text{i} y\right]\right]\right] = \frac{\pi}{4}, \text{Arg}\left[\text{N}\left[\text{Erf}\left[x + \text{i} y\right]\right]\right] = -\frac{\pi}{4}\right\}, \{x, 0, 5\}, \{y, 0, 5\}\right]$$


## ■ Figure 13b

`Show[antiStokes, ExactZeros]`

■ **Figure 13c**

```
NullAndStokes = ContourPlot[
  {Re[Erf[x + i y]] == 0, Im[Erf[x + i y]] == 0,
   Arg[N[Erf[x + i y]]] ==  $\frac{\pi}{4}$ , Arg[N[Erf[x + i y]]] ==  $-\frac{\pi}{4}$ },
  {x, 0, 5}, {y, 0, 5}, PlotPoints -> 50]
```



## ■ Figure 14

```
Plot3D[Arg[N[Erf[x + i y]]], {x, 0, 5}, {y, 0, 5},  
PlotRange -> {{0, 5}, {0, 5}, {-π, π}}, Ticks -> {{0, 5}, {0, 5}, {-π, π}}]
```

