Question 410 : Some fractals

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abstract
This note presents some fractals

1. Introduction. two integrals

$$\int_0^1 \left(\frac{\ln x}{\left(1+x^2\right)^2} - 3x \right) dx = -\frac{G}{2} - \frac{\pi}{8} - \frac{3}{2} \tag{1}$$

$$\int_0^1 \left(\frac{\ln x}{\left(1+x^2\right)^2} - 3\sqrt{x} \right) dx = -\frac{G}{2} - \frac{\pi}{8} - \frac{1}{2} \tag{2}$$

- Catalan constant: $G = 0.91596559...$
- Pi constant: $\pi = 3.14159265...$

This note presents Newton fractals for: $f(z) = \frac{\ln z}{\left(1+z^2\right)^2} - 3z$, and $g(z) = \frac{\ln z}{\left(1+z^2\right)^2} - 3\sqrt{z}$.

❖ Newton fractals for $f(z)=\dfrac{\ln z}{\left(1+z^2\right)^2}-3z$.

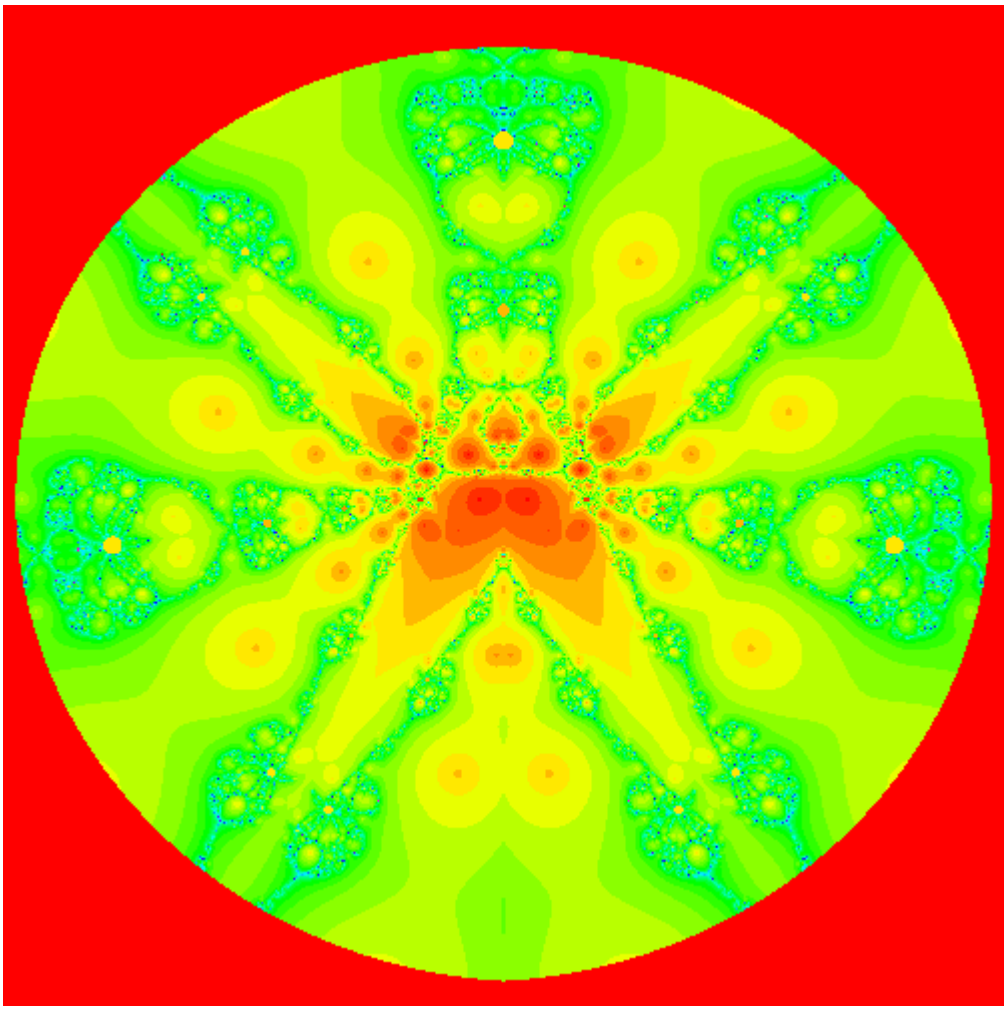

Figure 1.

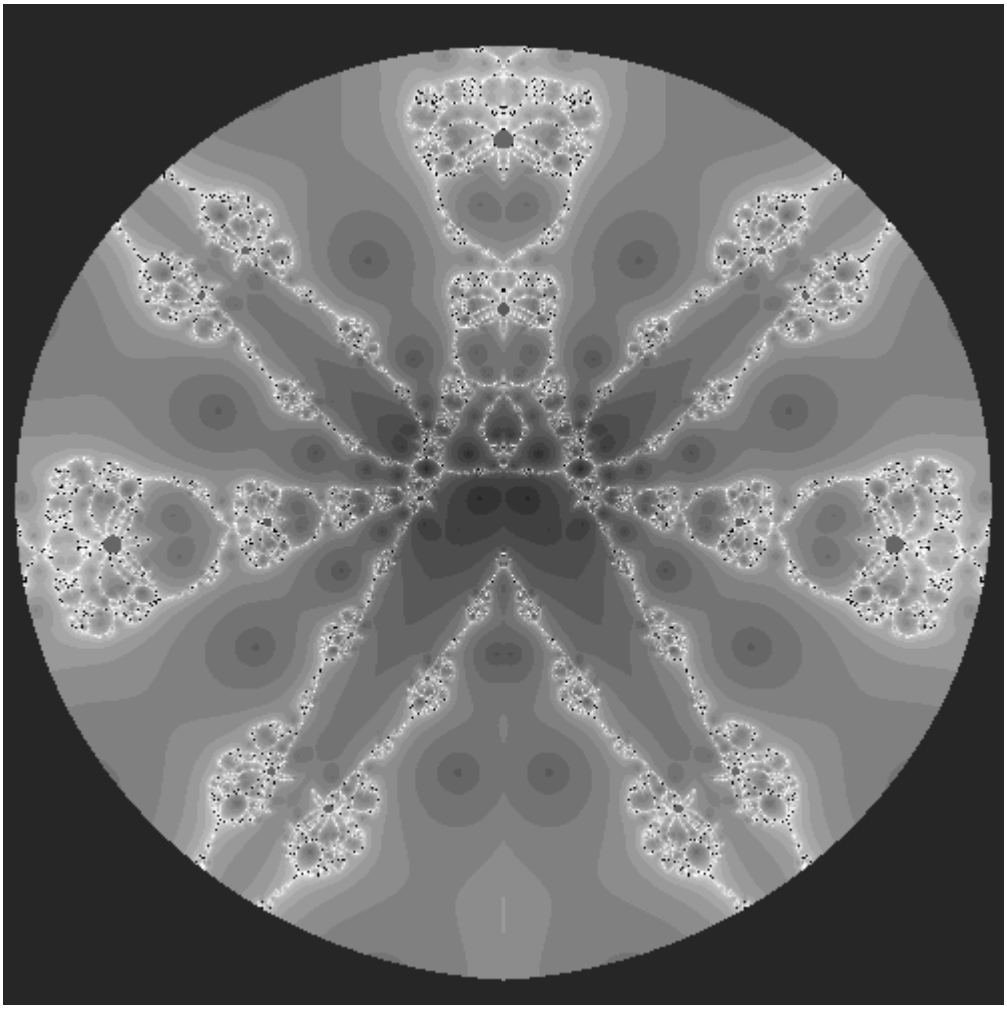

Figure 2.

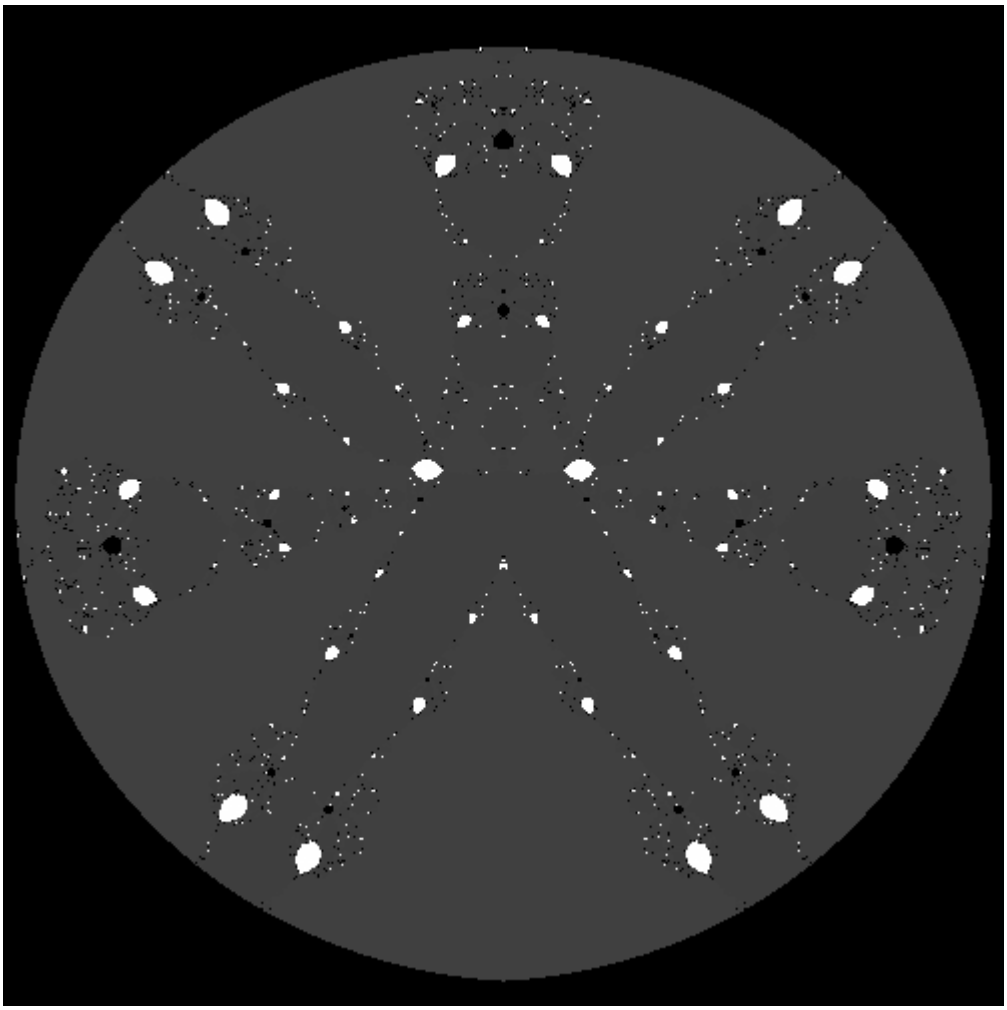

Figure 3.

❖ Newton fractals for $g(z)=\dfrac{\ln z}{\left(1+z^2\right)^2}-3\sqrt{z}$.

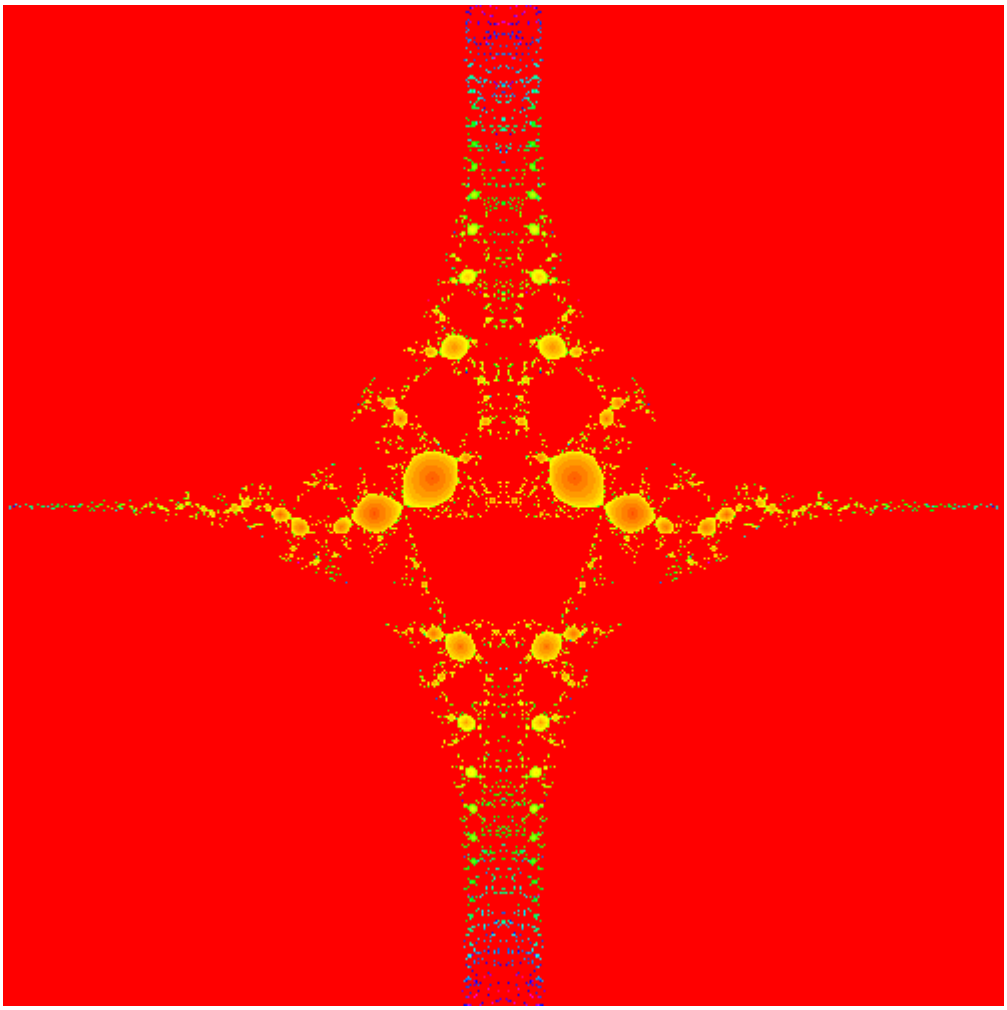

Figure 4.

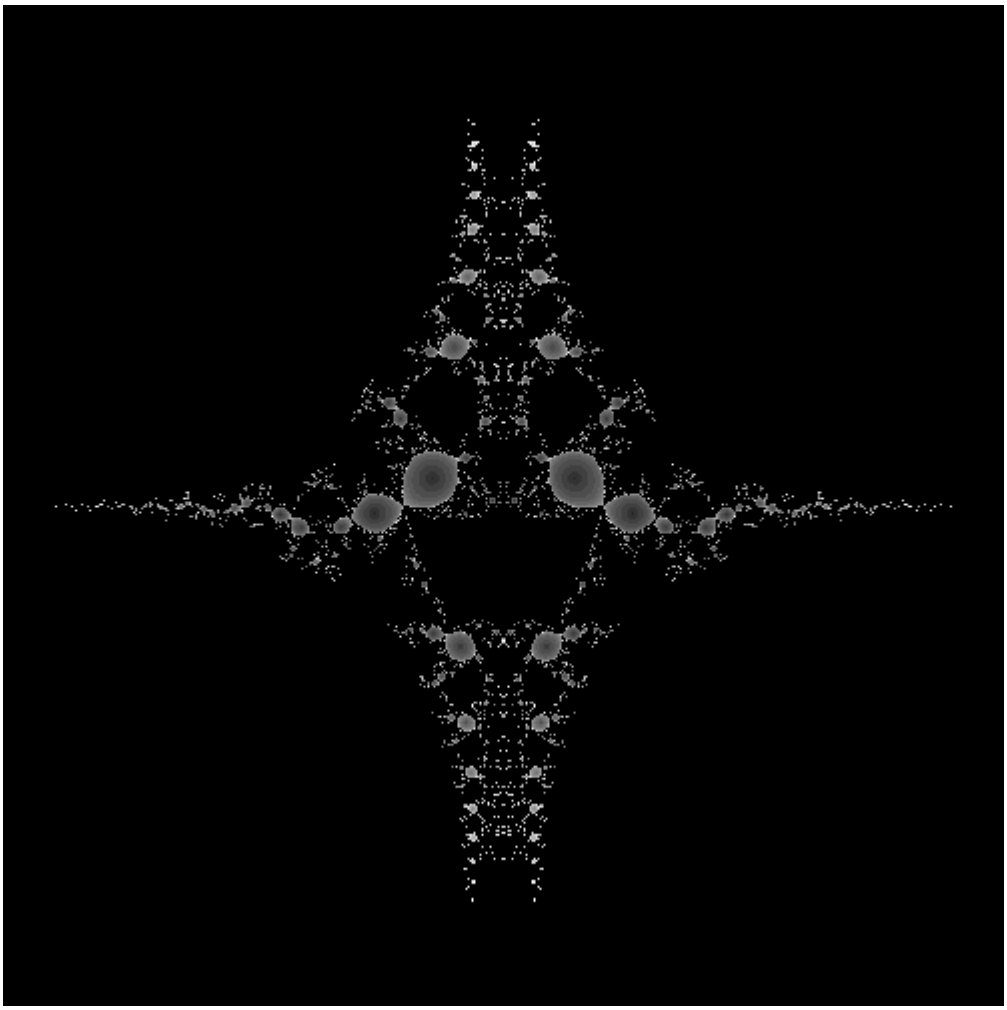

Figure 5.

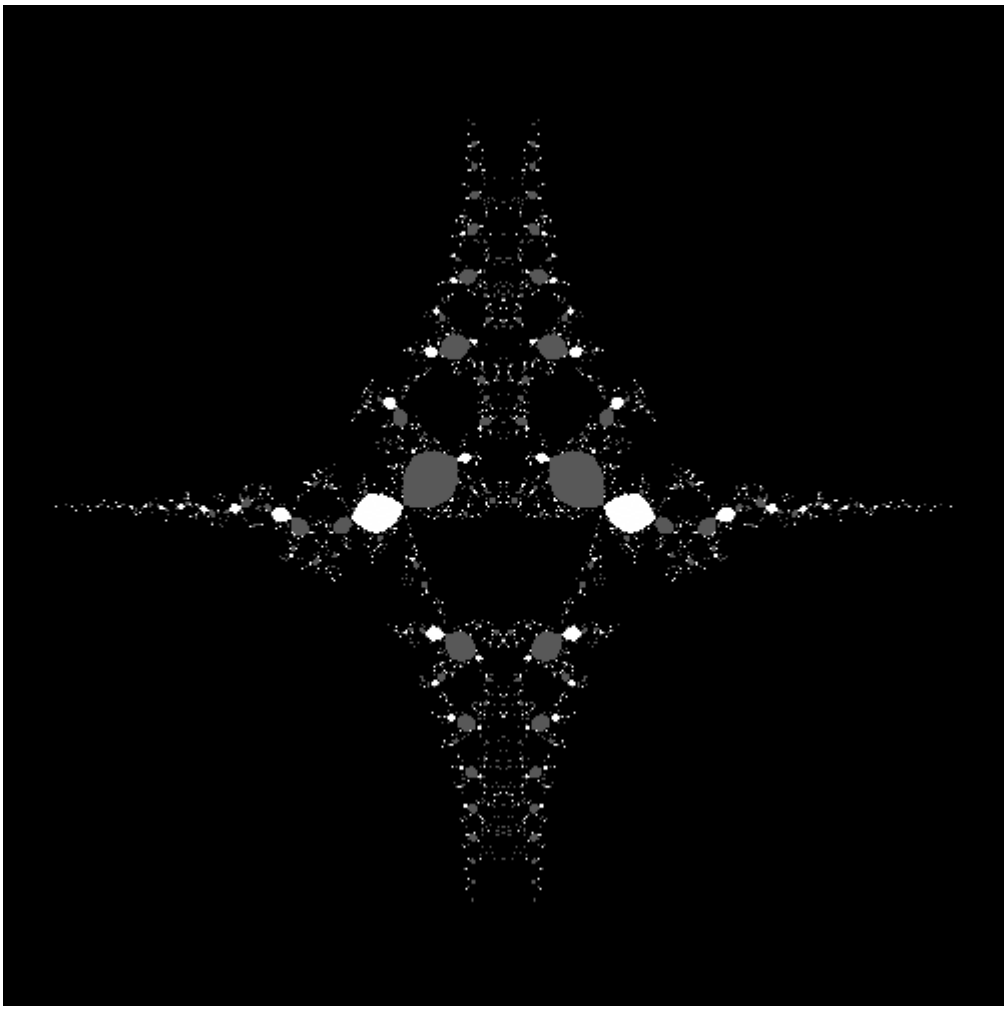

Figure 6.

References

1. Barnsley, M.F. and Rising, H.: Fractals Everywhere, 2nd ed. Boston, MA: Academic Press, 1993.
2. Devaney, R.L.: Complex Dynamical Systems: The Mathematics Behind the Mandelbrot and Julia Sets. Providence, RI: Amer.Math.Soc., 1994.
3. Peitgen, H.-O. and Saupe, D. (Eds.): The Science of Fractals Images. New York: Springer Verlag, 1988.