ICM 1998, Berlin, Aug. 18–27

Abstracts of Short Communications and Posters

Section:

4. Algebraic Geometry

1991 MS Classification: not given
Schulte, Udo, Technical University Ilmenau, Germany
From a difference equation for integers to a special closed curve for each positive integer

The recurrence relation $x_{n+k}^{(k)} = x_n^{(k)}$ of integers modulo $k > 1$ with initial conditions $x_l^{(k)} = l\,,\ 0 \leq l < k\,,\ l \in \mathbf{N}_0$, has the solution

$$x_n^{(k)} = \frac{k-1}{2} + \sum_{j=1}^{k-1} \frac{e^{\frac{2\pi i j n}{k}}}{e^{-\frac{2\pi i j}{k}} - 1}\,.$$

Extending n to a real variable x the functions $f_k(x)$ can be defined.
The parametric curves $(\mathrm{Re}(f_k(x))\,,\ \mathrm{Im}(f_k(x)))$ are closed curves with positive curvature meeting the points $\{0, 1, \ldots, k-1\}$ on a straight line.