5. FEATURES

Construction Zone: The Braikenridge-MacLaurin Construction

The projective plane is often thought of as the Euclidean plane with a line of infinity attached. The line at infinity is composed of the infinity of points at infinity, each of which can be viewed as the intersection point for sets of parallel lines. Such generality can offer enlightenment.

The Braikenridge-MacLaurin construction (Coxeter 1974) offers a strategy for constructing a conic through five given points in the projective plane. Imaginary lights suggest how the construction traces out the locus of a conic in the projective plane.

Given five points, A, B, C, A', B' (Figure 1). Represent each of these by a relatively large white light bulb. Join A to B' and A' to B by lighting, one at a time, a series of small white light bulbs from A to B' and from B to A'. Designate the intersection point of these two lines, N, by a white bulb larger than those along the lines, but not quite as large as those representing the five given points. Choose an arbitrary line, z_1, through N; draw it using a sequence of small red lights. Join A' to C by a line of small red lights. Label the intersection M, of $A'C$ and z_1, with a medium-sized red light. Join B' to C by a line of red lights. Label the intersection L of $B'C$ and z_1 with a medium-sized red light. Join A to M by a line of small red lights and join B to L by a line of small red lights. Label the intersection C_1' of AM and BL with a medium red light. The point C_1' lies on the conic.

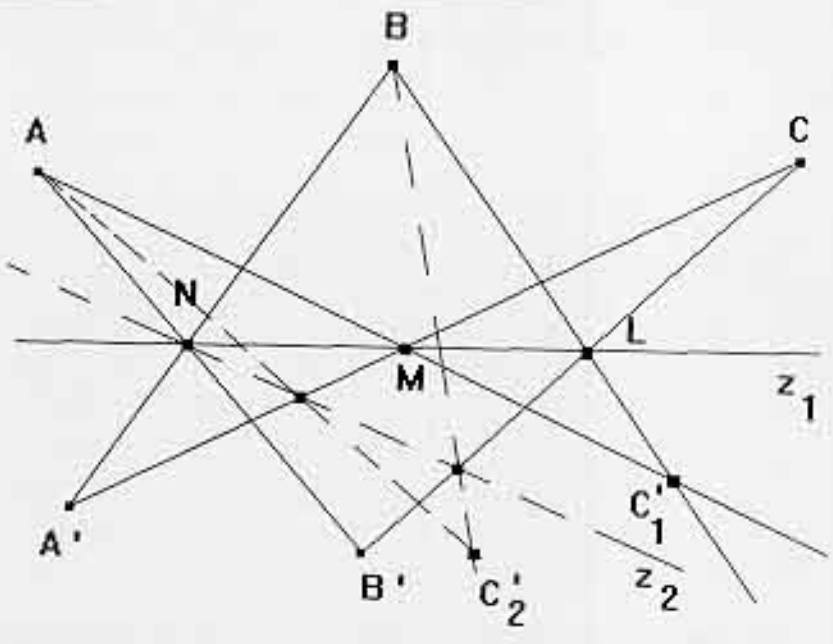

Figure 1. Braikenridge-MacLaurin Construction of a conic through five given points, A, B, C, A', and B' in the projective plane.

Now turn off all red lights except the one representing C_1'. Draw, using a sequence of small green lights, a line z_2 (different from z_1), through N. Repeat this construction, using green lights, producing in the end another point, C_2', on the conic. Leave the green light representing C_2' on and turn the others (green ones) off. Repeat this process using enough (three) different colors (a "Four-color Theorem" type of idea) to trace out the locus of the conic in lights!

Happy Holidays!

Reference

Coxeter, H. S. M. 1974. *Projective Geometry*, 2nd Ed. University of Toronto Press, Toronto.

Population Environment Dynamics Course and Monograph

Once again, *Solstice* board member William D. Drake invited S. Arlinghaus to co-teach a course in Population Environment dynamics based on Drake's ideas of transition theory. For the third consecutive year their efforts, together with those of the many fine students, have resulted in an interesting monograph, authored almost totally by the students. The student authors and content of *Population - Environment Dynamics: Towards Public Policy Strategies* are as listed below:

Deborah Carr, Stability in Rural Communities: Myth or Reality?

Cheri DeLaRosia, Population-Environment Trends in the Modernization of Thailand;

Rohinton Emmanuele, A City in Transition: Urban Demographic Changes in Detroit and Their Impact on Urban Greenness and Climate;

Noah Hall, Coastal Protection and the Coastal Population-Environment Dynamic;

Timothy Macdonald, NAFTA and the Human Element, A Region in Transition;

Soonae Park, Demographic Transition and Economic Growth in Korea: Comparison between Asian Countries;

Carlos de la Parra, Analysis of Transitions in the U.S.-Mexico Border;

Brent Plater, Population Policy and Environmental Quality;

Shelley Price, A Framework of Pollution Prevention and Life-Cycle Design: Aiding Developing Nations through Transition to Industrialization;

Richard Wallace, Motor Vehicle Transport and Global Climate Change: Policy Scenarios;

Tracy Yoder, An Inquiry into Determinates of Fertility.

6. SAMPLE OF HOW TO DOWNLOAD THE ELECTRONIC FILE BACK ISSUES OF *SOLSTICE* ON A GOPHER

Solstice is available on a GOPHER from the Department of Mathematics at Arizona State University: PI.LA.ASU.EDU port 70

BACK ISSUES OF *SOLSTICE* AVAILABLE ON FTP

This section shows the exact set of commands that work to download *Solstice* on The University of Michigan's Xerox 9700. Because different universities will have different installations of TEX, this is only a rough guideline which *might* be of use to the reader. (BACK ISSUES AVAILABLE using anonymous ftp to open um.cc.umich.edu, account IEVG; type cd IEVG after entering system; then type ls to get a directory; then type get solstice.190 (for example) and download it or read it according to local constraints.) Back issues will be available on this account; this account is ONLY for back issues; to write Solstice, send e-mail to sarhaus@umich.edu.

First step is to concatenate the files you received via bitnet/internet. Simply piece them together in your computer, one after another, in the order in which they are numbered, starting with the number, "1."

The files you have received are ASCII files; the concatenated file is used to form the .tex file from which the .dvi file (device independent) file is formed. They should run, possibly with a few harmless "vboxes" over or under. ASSUME YOU HAVE SIGNED ON AND ARE AT THE SYSTEM PROMPT, #.

create -t.tex

percent-sign t from pc c:backslash words backslash solstice.tex to mts -t.tex char notab

(this command sends my file, solstice.tex, which I did as a WordStar (subdirectory, "words") ASCII file to the mainframe)

run *tex par=-t.tex

(there may be some underfull (or certain over) boxes that generally cause no problem; there should be no other "error" messages in the typesetting–the files you receive were already tested.)

run *dvixer par=-t.dvi

control *print* onesided

run *pagepr scards=-t.xer, par=paper=plain