

# CONNECTANY: A Microworld for Mathematical Investigations

by Tim Barclay

This program allows you to draw patterns by connecting points on a circle. You tell the computer to step round the circle counting different numbers. The purpose is to discover what numbers make what patterns and see if you can make predictions about what the pattern will look like based on the initial numbers chosen. The procedure BEGIN initiates the program.

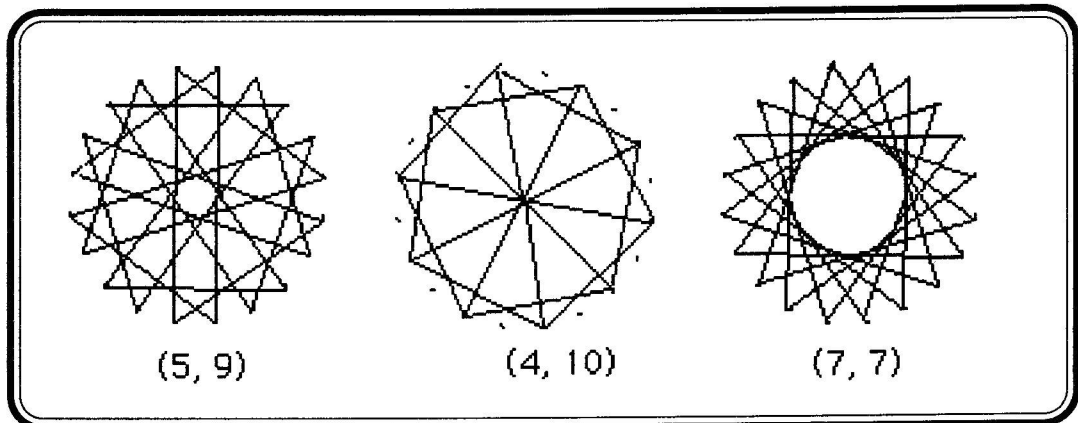
The problem becomes more interesting when two stepping numbers are entered. For example, let's say you have a circle that has 20 points and your stepping numbers are 7 and 10. Here's how the pattern gets drawn. First the 20 point circle appears. Then a line connects the first point (0) with the 7th point. Then a line is drawn from the 7th point to the 17th point

since the second stepping number is 10. The lines continue to get connected until a line gets drawn to the original point.

The idea for this program originally came from a letter from three primary school girls printed in a British journal, *Mathematics Teaching*. The letter also included a printout of examples of circle patterns they had gotten (see diagram below). Quoting from the letter:

*"...Then we recorded our results on a table, keeping the points on the circle the same. We came to the conclusion that the two step-numbers always added up to a number of which the only common factor is one (if the number of points on the shape is 20). We checked this theory using other numbers."*

This is an example of one investigation of the patterns that exist within CONNECTANY. There is no single answer students should try to get because the microworld of CONNECTANY is a rich one and offers many different discoveries. Δ



# Spiros

by Bob Jensen

S is a command that takes three numbers as inputs. It then draws a right spiroilateral by consecutively walking off each distance inputted followed by a 90 degree right turn. This pattern is continued until the path closes. The resulting figure is then classified as either a WUMPUS, WHIMSY, or GLOOP.

Can you predict what figure will result based on the numbers inputted? Δ

