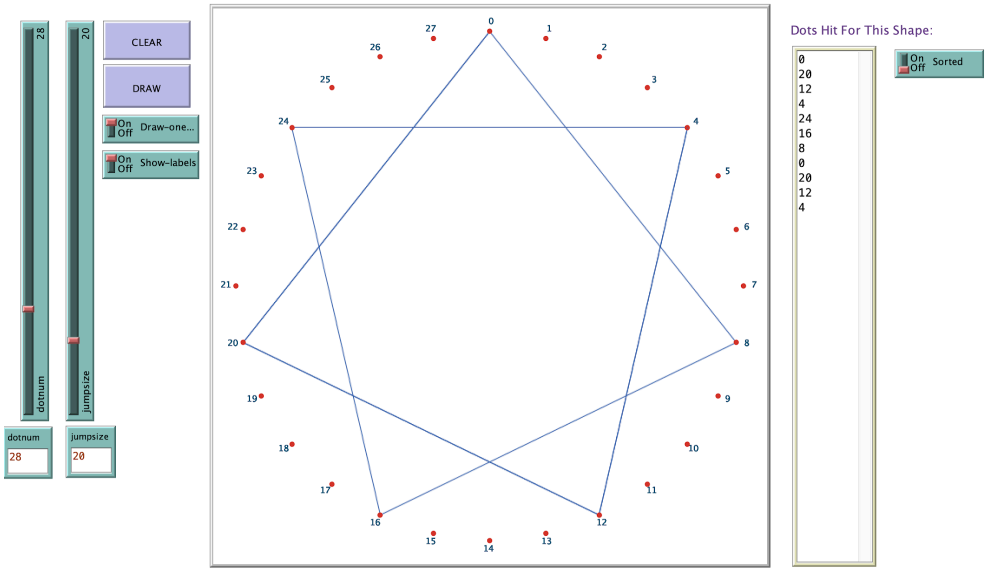
DRIMAS 2020/2021

Hi, I'm Akea for my class's latest MST unit we learned about conjectures. The conjectures that we made were made with something called the CTD rules (standing for connect the dots). A fully made CTD equation will be something like this.



A CTD circle is made up of dots or points each dot or point having a designated number. The number of dots total on the given CTD is called the dotnum (or dot number). In ctd a line starting at 0 will jump from dot to dot making as many rotations as it needs until it touches 0 a second time. The number of dots that it skips with each jump is known as the jump size, for the example you see above the jumpsize is 20 and the dotnum is 28. We used a program called netlogo to run this.

The story of how I got to my conjecture is very long. When we first began to look at CDT I noticed that the number eight was hit at a startlingly high rate when the dotnum equaled 16. Based on this I made my first conjecture "All jump sizes except for 16 must form an angle at the number 8 as long as the dotnum equals 16". This was a good start but the conjecture was too "basic". But when i tested the conjecture against other dotnums it did not hold up against other dot numbers, so I changed the conjecture to fit all dot numbers. I thought that the dot that equals half of the dotnum is hit every time. But this didn't work either. Finally after trying 313 different examples the conjecture landed at "the dot that equals half of the dotnum value will be hit by all jump sizes except when the jump size equals the dotnum as long as that half is an even number, except by multiples of four except when the dotnum is a multiple of eight". But there were even some exceptions to this. IAfter running 313 tests in an attempt to prove my conjecture i was very tired. I tested my conjecture on all dotnums that were multiples of four met with Alex to discuss some of the problems that I had and we tried to find a new simpler solution.

The conjecture that I finally came to was that "The jump size that equals the dotnum skips all numbers except 0". This means that when the jump size and the dotnum are equal the line

simply wont exist the only number that it will hit will be 0. This happens simply because the number of dots skipped is simply because the jump size equals the number of dots on the CDS. I checked this with all dotnums going up to 48 and it worked for all of them. Netlogo has something on the side of each CTD equation saying all numbers hit by the line when the jumpsize equaling the dotnum was put in it would just result in a 0 showing up as 0 was the only number hit.

Dotnum: the number of dots on the CDS
Jump size: the number of dots the line hopes over with each jump
Circle: a plane curve
Shape: the structure created by the line
Line: the strand between eavh