

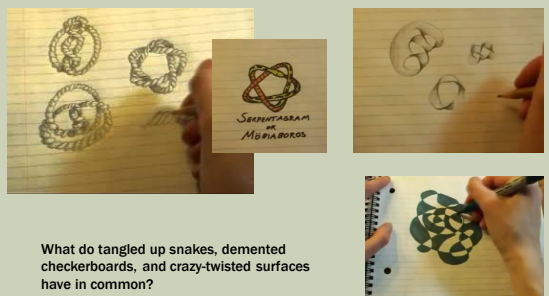
## HUMAN KNOT CHALLENGE 10/28/14

Part 1: Human knot:

- How likely is it that a human knot game will be solvable?
- Can you tweak the rules to make an unsolvable game more/less likely?



## VI HART'S SNAKES + GRAPHS



What do tangled up snakes, demented checkerboards, and crazy-twisted surfaces have in common?

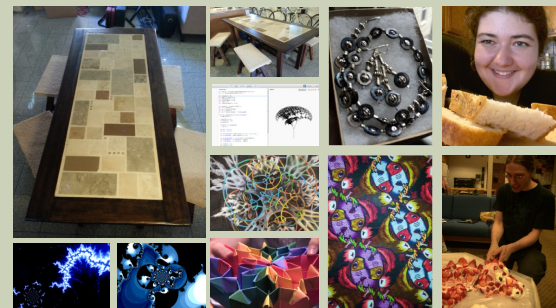
# KNOTS AND STARS

(and braids!)





## HI! I'M ZANDRA VINEGAR




## I LIKE TO MAKE THINGS





## ID YOUR KNOTS

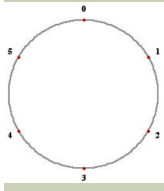
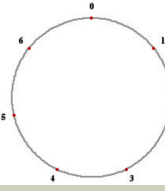
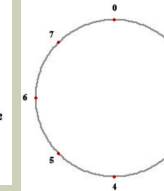
<p>Trefoil</p> 	<p>Square Knot</p> 
<p>Pentafoil</p> 	<p>Heptafoil</p> 

### THE FOIL FAMILY

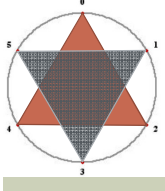
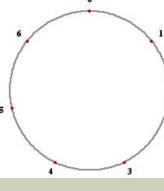
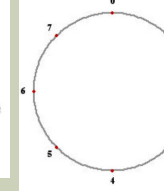
Trefoil 

Pentafoil       Heptafoil 

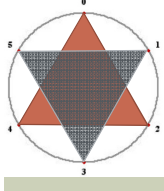
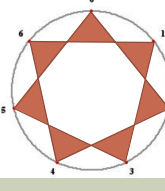
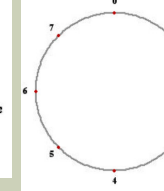
### SINGLE-PATH STARS

<b>POINTS: 6</b> <b>JUMP: 2</b>	<b>POINTS: 7</b> <b>JUMP: 2</b>	<b>POINTS: 8</b> <b>JUMP: 2</b>
		

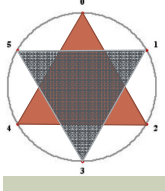
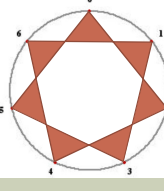
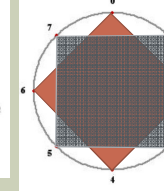
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### SINGLE-PATH STARS

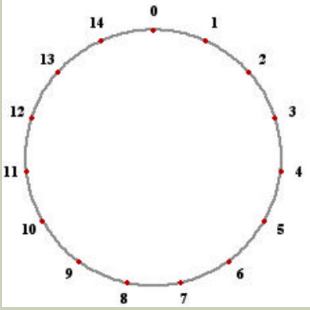
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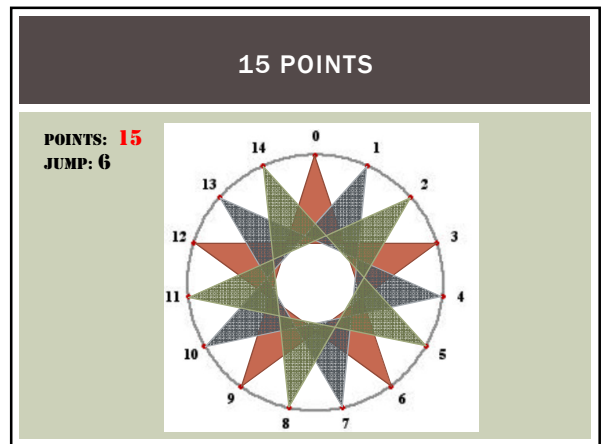
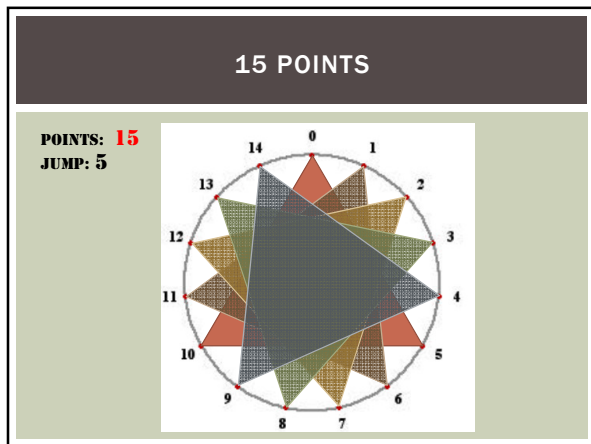
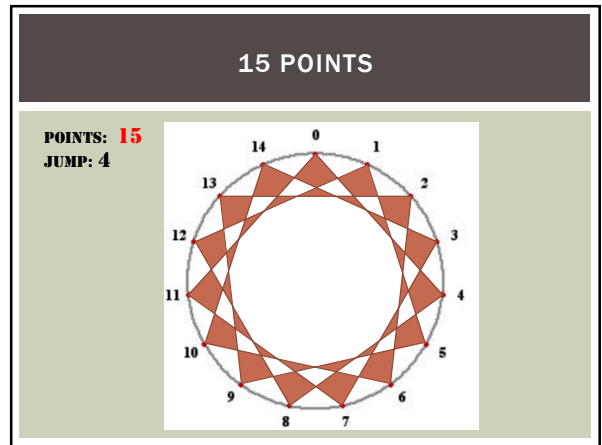
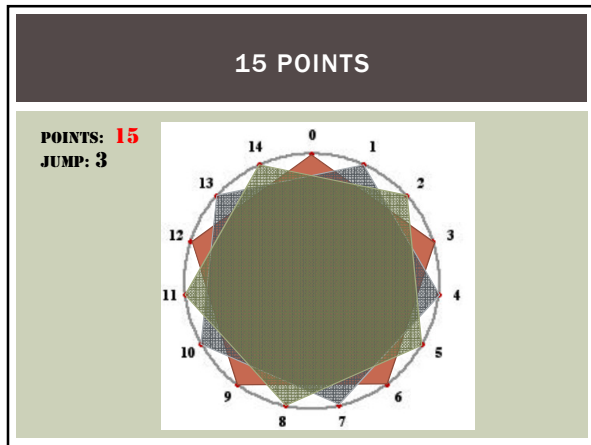
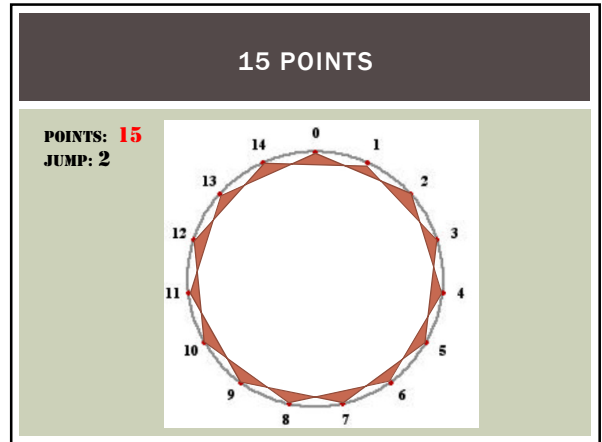
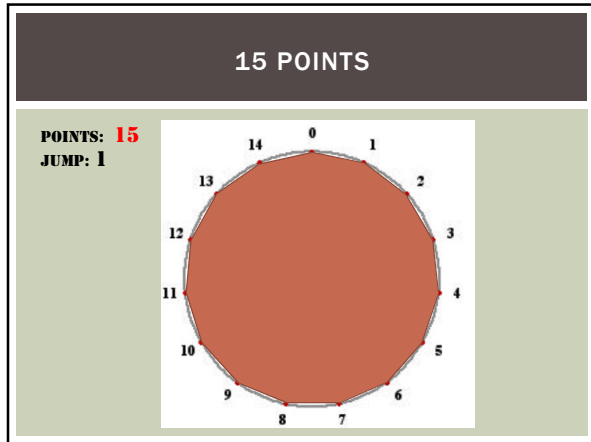
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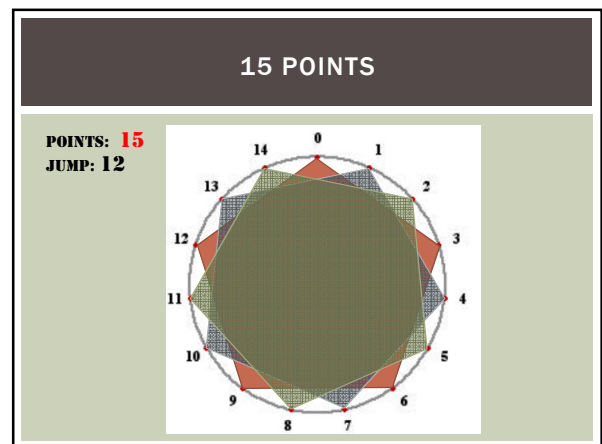
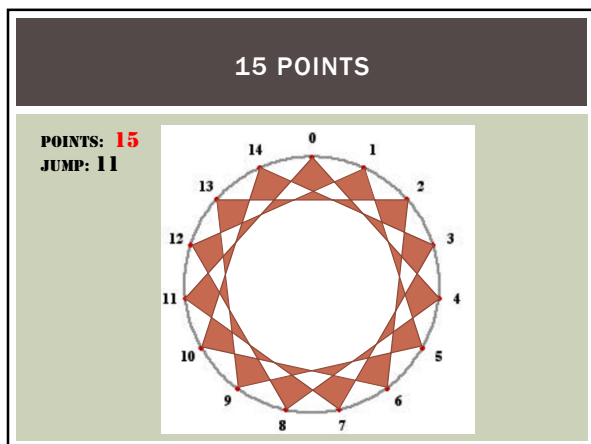
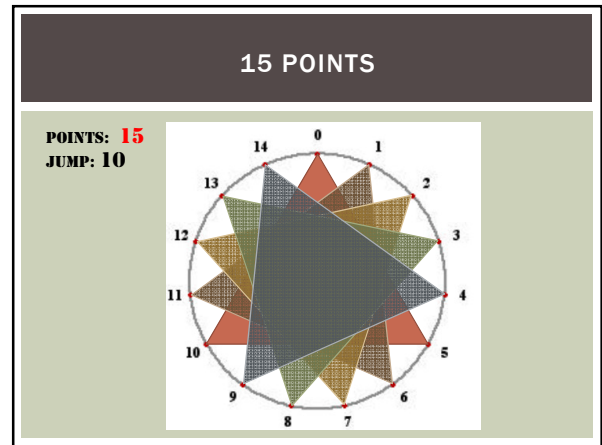
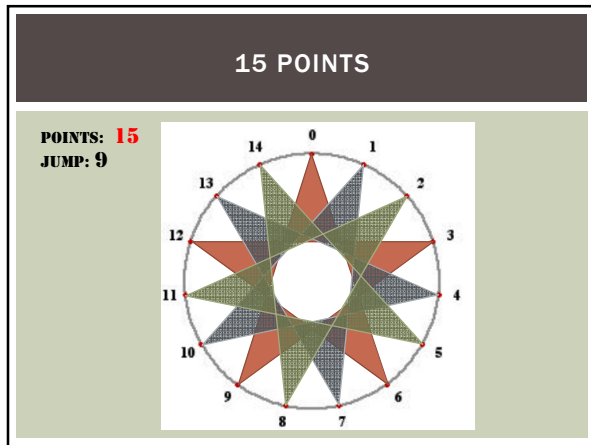
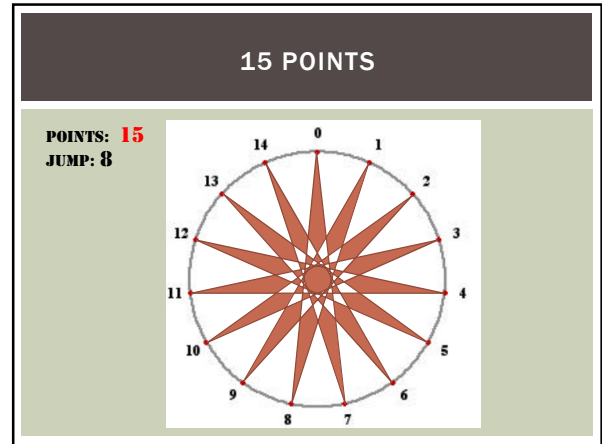
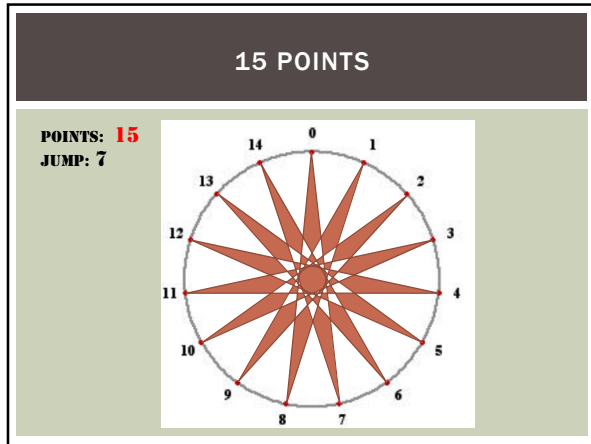
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### 15 POINTS

**POINTS: 15**  
**JUMP: \_\_\_?**







**15 POINTS**

**POINTS: 15**  
**JUMP: 13**

**15 POINTS**

**POINTS: 15**  
**JUMP: 14**

**15 POINTS**

**POINTS: 15**

**WHAT IS A "JUMP 3 KNOT?"**

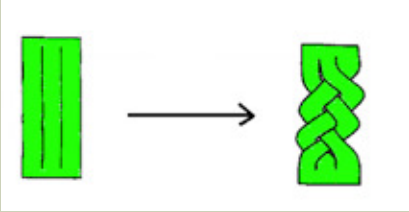
**HOW ABOUT JUMP 4?**

**VI HART'S SNAKES + GRAPHS**

What do tangled up snakes, demented checkerboards, and crazy-twisted surfaces have in common?

### BRAIDING PAPER

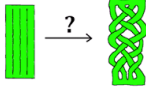
Is it possible to make a braid with no loose ends?



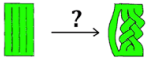
### BRAIDING PAPER

**Taking it Further**

Why stop at three strands? Can you make this no-free-end version of a four-strand braid? Try it! (Use a piece of felt with three slits.)



How about a three-braid with an extra strand along for the ride?



### KNOT CHALLENGES

1. Braid your paper.
2. Try a 4-strand paper (or felt) braid.
3. Try a 3-strand braid on 4 pieces while 1 stays free.
4. Draw or make a knot that looks like it has only 4 crossings, and which cannot be redraw to have fewer. Try to do the same for 6 crossings.
5. Tie your own 13-loop braid-knot.