Handout: Simple Cases

One Rope Segment
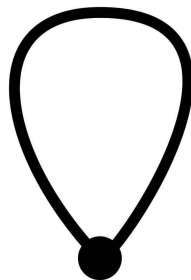
1. Draw a dots-and-lines drawing for the above picture, using a dot for each umbrella and a line for each rope segment.

2. Consider the simplest graph:

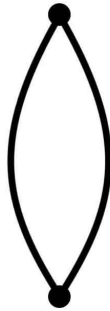   One umbrella and one rope segment, and even umbrellas:
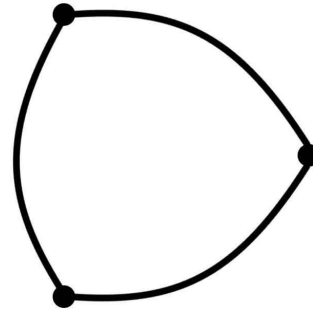

   Can we trace it? Yes!

   [What do we learn? Loops are easy and don't add any complexity, so we don't even need to think about them from now on.]

3. What about two and three rope segments:

Two rope segments   **Three rope segments**

Use one rope to trace out all the rope segments in each picture.

4. Find a picture with FOUR rope segments and all even umbrellas? Can you find a second such picture? Trace all four rope segments in each picture with just one rope.

5. Find all the pictures with FIVE rope segments and only even umbrellas?

   [Hint: could you build up from situations you've already seen?]

6. Use one rope to trace each of the pictures with FIVE rope segments and only even umbrellas. To help with this, try breaking this case down by removing a loop and then dealing with the rest?

7. How about SIX ropes segments and only even umbrellas?

   [Don't spend too long on this.]

8. Is there a way to always build up from a smaller cases? Hint consider these graphs for three and four edges: