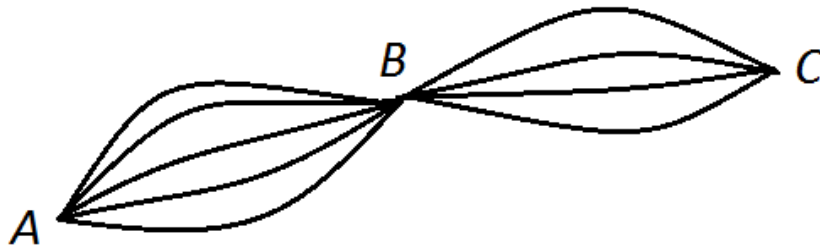
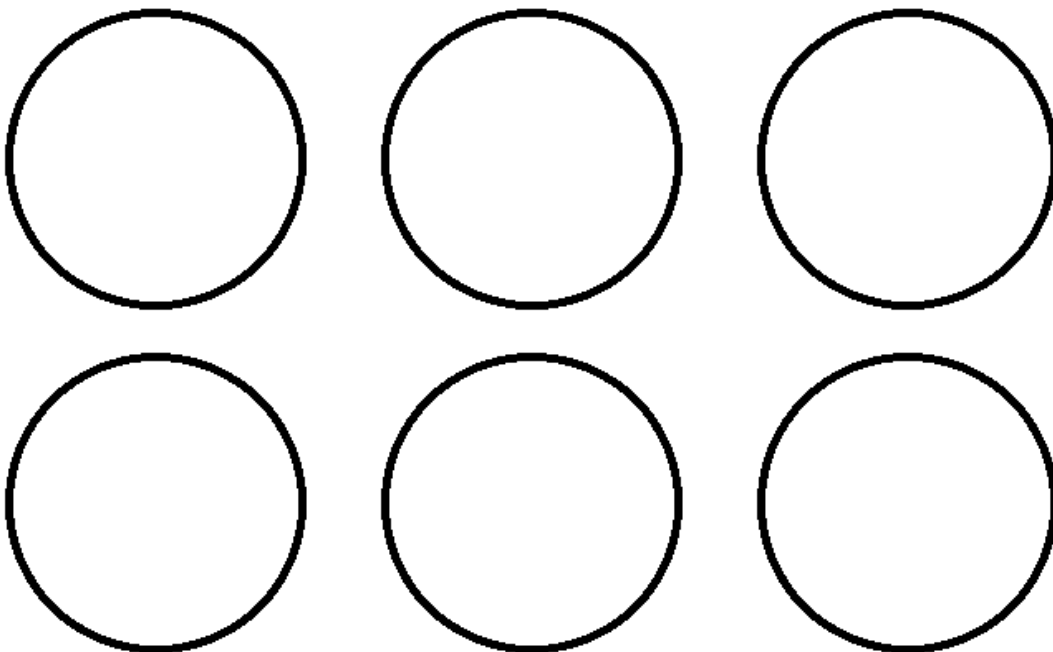


Counting<sup>1</sup>  
February 25, 2017

1. In a small country there are 3 cities: A, B, and C. There are 5 roads between A and B, and 4 roads between B and C. In how many different ways can one travel from A to C?



2. What is the most number of parts in which you can cut a circle with 2 distinct lines?
  - a. What about 3 lines?
  - b. What about 4 lines?
  - c. What about 5 lines?
  - d. What about 20 lines?



<sup>1</sup> Inspired by Sergey Dorichenko's *A Moscow Math Circle*, from MSRI's Mathematical Circles Library.

3. An anagram of a word is a rearrangement of the letters to form a different word. For example, with the word RAMS we can make ARMS. We will also count the arrangement RMSA as an anagram, even though it is not a word.
  - a. How many anagrams does the word WE have? List them.
  - b. What about JOY? List them.
  - c. What about MATH?
  - d. What about TIGER?