Warmups

Wordline

A wordline is an ordered sequence of words that progress in some measurable value, such as drizzle shower downpour, or morsel snack meal feast. Words that can not be compared with the others are not allowed: for example, drizzle shower rain downpour is not a wordline because rain is a general term that does not indicate quantity, and drizzle shower sleet downpour is not a wordline because sleet indicates a snowish quality that deviates from the rainish progression of the others.

What’s the longest wordline you can come up with in English? (We’ll disallow one two three ...)

Alphabetical Integers

Suppose the integers from 1 to 10 billion are written as English words, and alphabetized as if in the dictionary. What is the first odd number to appear?

For example, 9 would be written nine and 132 as one hundred thirty two. 4,623,012,701 is written as four billion six hundred twenty three million twelve thousand seven hundred one and appears later in the dictionary than eight but before seven. 14 appears after 400 and before 42.

Duck and Dog

Duck is in the middle of a large circular pond, playing a game with her friend Dog. Dog can run around the shoreline 4 times as fast as Duck can swim, but can not enter the water. Duck wins if she can reach any point on the shore without Dog being there. If by the end of playtime Duck has not done this, Dog wins. Assuming both are clever, who will win, Duck or Dog?

Triangles Everywhere

Argue that for any closed curve in the plane, one can select three points on the curve that form an equilateral triangle.