

Speaker:

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Position: Professor Emeritus

Title: The four points

Intended Audience: High School

Type of Presentation

Preferred: Short Presentation (less than 20 minutes)

Description:

Given four distinct points in space, there are six possible distances between pairs of them. Is it possible that all six of these distances are the same?

The answer is no, but it becomes yes if we are able to go into the third dimension.

We can next ask whether each of the six distances is one of two distinct numbers. This is an interesting question that requires almost no geometric background for a middle school or junior high school class to get into. Most groups will quickly identify the four vertices of a square, but take longer to isolate the other five possibilities, especially the one that does not include the vertices of an equilateral triangle.

This can be addressed at many levels, from the purely descriptive to that at which the students can be asked to identify the ratio of the two distances and the angles.