

Some Problems for 2/25

2/25.1) n points, $n \geq 4$ are chosen on the circumference of a circle are chosen so that no three line segments joining pairs of points pass through the same point of the interior of the circle. Determine the number of interior intersections of the all the line segments joining pairs of points.

2/25.2) Find infinitely many solutions to

$$x^2 + y^2 + z^2 = 3xyz.$$

2/25.3) Let $P_1, P_2, \dots, P_{1999}$ be distinct points in the plane. Draw the line segments $P_1P_2, P_2P_3, \dots, P_{1998}P_{1999}, P_{1999}P_1$. Is it possible to draw a line L which intersects each of these line segments in an interior point?

2/25.4) Each of ten line segments has length greater 1 but less than 55. Prove that it is possible to select three such that they form the sides of a triangle.