Geometry of Equations

Station guide

This station explores coordinate geometry and its interplay with linear equations and loci, building on the ideas explored at Thinking about Geometry and Thinking about Algebra.

The introduction of coordinates by Descartes heralded a mathematical revolution (as discussed in Cartesian coordinates), leading to a convergence of these two major areas. At this station we will explore how choosing to take a geometric approach to algebraic problems or an algebraic approach to geometric problems can prove valuable.

Some of the resources at this station review the equations of parallel and perpendicular lines in this context. Simultaneous squares, for example, asks students to use their knowledge of these to find the equations of the sides of a square given information about the square, while Between the lines offers an intriguing problem concerning the area between two parallel lines.

Simultaneous linear equations are another area where geometric thinking can prove powerful; Negatively triangular invites students to construct simultaneous equations with certain geometric properties, while Near miss encourages students to think carefully about their geometric meaning.

The third aspect explored at this station is the use of coordinate geometry to calculate loci. The circle of Apollonius is a classical problem in this area, and several of the review questions also encourage thinking along these lines.

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