Problem-Based Learning (PBL): A Transformed Perspective for Standards-Based Geometry
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Topics Covered

Pythagorean Theorem and connections to Area problems; Proofs of the Pythagorean Theorem

Distance Formula and its connection to the Pythagorean Theorem

Calculator and GeoGebra Skills

Midpoint Formula

Equations of Lines, Focus on Point-Slope form; Collinear points; Slope

Perpendicular Bisector and Equidistant Points

Rotational Symmetry

Basic Euclidean Geometry: Examining Planes and lines

Vectors; Vector Length; Scaling Vectors

Solving systems of Equations

Triangle Congruence; Proving two triangles congruent; SSS SAS ASA AAS, not AAA

Parallel lines and their properties

Properties of Quadrilaterals

Similarity, with a focus on triangles and similar areas

Dilations, Rotations, Translations, Reflections. Focus on using GeoGebra to do transformations; Reflections with vector translation algebraically

Triangle Inequality Theorem

Generalized Pythagorean Theorem, Converse of Pythagorean to tell whether a triangle is obtuse or acute

Proofs using parallel theorems, triangle congruence, polygons

Special segments in triangles, with a focus on intersections using calculator

Parallelogram Area formula with vectors

Three Parallels Theorem

Interior and Exterior Angles in polygons

Basic Right Triangle Trigonometry: Tangent and Sine First (then inverses of those) and Cosine is taught later

Coordinate geometry with basic trig to find angles in non-right triangles

Areas of regular polygons

Circles, their equations (centered at the origin), circumference formula, area formula (proofs)

Properties of Arcs, chords, secant lines, tangent lines, and inscribed angles, and problem solving with these topics. Focus on using trigonometry to find what you are looking for rather than formulas

Two Tangents to a Circle, Common chords to a circle

Volume and surface area of prisms, cones, pyramids, and spheres

For more information go to www.carmelschettino.org