

**HIGH SCHOOL MATHEMATICS CHECKLIST**  
**Geometry, Goal 9**  
**Illinois Learning Standards A-C**  
**Assessment Frameworks**

**PSAE test questions are derived from this list.**

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**DEFINITIONS AND PROPERTIES**

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- \_\_\_\_\_ Apply the Pythagorean theorem to geometric problems. **IT, AG**
  
- \_\_\_\_\_ Compute measures for triangles (e.g., altitude, interior and/or exterior angles, unknown sides). **IT**
  
- \_\_\_\_\_ Determine how changing the scale factor affects the size and/or position of figures in the plane. **AG**
  
- \_\_\_\_\_ Understand simple conformal transformations such as dilations (work with similar polygons).
  
- \_\_\_\_\_ Identify transformations of figures in the plane to match specified criteria.
  
- \_\_\_\_\_ Solve problems involving similar figures. **AG**
  
- \_\_\_\_\_ Understand classifications of triangles according to their interior and/or exterior angles and/or lengths of sides. **IT**
  
- \_\_\_\_\_ Understand classifications of figures in the plane (other than triangles) according to their properties.
  
- \_\_\_\_\_ Solve simple problems using algebraic techniques that require knowledge of triangle and quadrilateral properties. **AG**
  
- \_\_\_\_\_ Apply the sum of the interior angles proposition and the exterior angles proposition for convex polygons.
  
- \_\_\_\_\_ Use the concept of complementary and supplementary angles to solve problems of the polygon.
  
- \_\_\_\_\_ Know the basic definitions of the trigonometric functions (sin, cos, tan). **IT**
  
- \_\_\_\_\_ Solve simple problems using the properties of parallel lines cut by transversals.
  
- \_\_\_\_\_ Identify two-dimensional patterns for three-dimensional models, such as cylinders, prisms, and cones.

\_\_\_\_\_ Identify two- and three-dimensional figures that would match a set of given conditions. **AG**

\_\_\_\_\_ Identify geometric shapes using coordinate geometry.

\_\_\_\_\_ Identify elements of three-dimensional geometric objects (e.g., diagonals of rectangular solids), and describe how two or more objects are related in space (e.g., skew lines, the possible ways three planes might intersect).

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## **GRAPHING**

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\_\_\_\_\_ Solve problems that involve calculating distance, midpoint, and slope using coordinate geometry.

\_\_\_\_\_ Given a polygon in the coordinate plane, make transformations— rotations, reflections, and translations—by graphing the coordinates of the vertices of the transformed polygon and sketching the resulting figure.

\_\_\_\_\_ Find the distance between two points on a coordinate graph (problem types that require knowledge of the Pythagorean theorem or the distance formula).

\_\_\_\_\_ Work problems that require the use of trigonometric functions (e.g., find the height of an object using indirect measurement knowing the distance to the base and the angle of elevation). **IT**

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## **PROOF AND CONSTRUCTION**

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\_\_\_\_\_ Judge the completeness and correctness of an alleged geometric proof, both for geometry set in the synthetic plane and geometry set in the coordinate plane.

\_\_\_\_\_ Understand and apply the conditions that assure congruence and similarity. **AG**

\_\_\_\_\_ Understand and use mathematical and geometrical axioms, fundamental theorems of geometry, and deductive reasoning.

\_\_\_\_\_ Understand and apply the triangle inequality.

\_\_\_\_\_ Understand logic, proof techniques such as indirect proof, and the role of counterexamples. **AG**