INDIAN HILL EXEMPTED VILLAGE SCHOOL DISTRICT
Mathematics Curriculum - May 2009
High School – Geometry Concepts & Applications

Main Idea: Points, lines, and planes. Graphing

Skills & Objectives:

- Formally define and explain key aspects of geometric figures including:
  - 3.A.1.a interior and exterior angles of polygons;
  - 3.A.1.b segments related to triangles (median, altitude, midsegment);
  - 3.A.1.c points of concurrency related to triangles (centroid, incenter, orthocenter, and circumcenter);
  - 3.A.1.d circles (radius, diameter, chord, circumference, major arc, minor arc, sector, segment, inscribed angle
- Recognize and explain the necessity for certain terms to remain undefined, such as point, line and plane

Main Idea: Triangles & Quadrilaterals

Skills & Objectives:

- Formally define and explain key aspects of geometric figures including:
  - interior and exterior angles of polygons;
  - segments related to triangles (median, altitude, midsegment);
  - points of concurrency related to triangles (centroid, incenter, orthocenter, and circumcenter);

Main Idea: Using Ratio and Proportion

Skills & Objectives:

- Convert rates within the same measurement system; e.g., miles per hour to feet per second; kilometers per hour to meters per second.
- Use unit analysis to check computations involving measurement.
- Use the ratio of lengths in similar two-dimensional figures or three-dimensional objects to calculate the ratio of their areas or volumes respectively.
- Solve problems involving unit conversion for situations involving distances, areas, volumes and rates within the same measurement system

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Main Idea: Polygons and Area

Skills & Objectives:

- Identify the reflection and rotation symmetries of two- and three-dimensional figures.
- Construct right triangles, equilateral triangles, parallelograms, trapezoids, rectangles, rhombuses, squares and kites, using compass and straightedge or dynamic geometry software.
- Construct congruent or similar figures using tools, such as compass, straightedge, and protractor or dynamic geometry software.
- Perform reflections and rotations using compass and straightedge constructions and dynamic geometry software.

Main Idea: Surface area and volume

Skills & Objectives:

- Convert rates within the same measurement system; e.g., miles per hour to feet per second; kilometers per hour to meters per second.
- Use unit analysis to check computations involving measurement.
- Use the ratio of lengths in similar two-dimensional figures or three-dimensional objects to calculate the ratio of their areas or volumes respectively.
- Use scale drawings and right triangle trigonometry to solve problems that include unknown distances and angle measures.
- Solve problems involving unit conversion for situations involving distances, areas, volumes and rates within the same measurement system.

Main Idea: Trigonometry

Skills & Objectives:

- Use scale drawings and right triangle trigonometry to solve problems that include unknown distances and angle measures.
- Solve problems involving unit conversion for situations involving distances, areas, volumes and rates within the same measurement system.
- Define the basic trigonometric ratios in right triangles: sine, cosine and tangent.
- Apply proportions and right triangle trigonometric ratios to solve problems involving missing lengths and angle measures in similar figures

Main Idea: Angles of a circle

Skills & Objectives:

- Formally define and explain key aspects of circles including:
    - circles (radius, diameter, chord, circumference, major arc, minor arc, sector, segment, inscribed angle
- Determine the measures of central and inscribed angles and their associated major and minor arcs.
- Solve problems involving chords, radii, and arcs within the same circle.
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