
Unit 4: Lesson Plans

Unit 4: Trigonometry Triangle Applications: Lessons 1-22

I. Unit Objectives

- Students will solve right triangles given one angle and one side of the triangle or students will solve right triangles given two sides of the triangle.
- Students will use right triangle operations to solve Isosceles triangles.
- Students will solve application problems involving right triangles.
- Students will solve application problems involving angles of depression and angles of inclination (elevation).
- Students will find the length of a parallel of Earth at the latitude where the Sphinx is located, and will identify other facts about this famous structure using right triangle trigonometry.
- Students will solve advanced right triangle applications and understand the conundrum issue of improperly stated word problems.
- Students will observe and develop informal proofs for the “Law of Sines”.
- Students will apply the “Law of Sines” to situations where the measures of two angles and one side are given (AAS or ASA).
- Students will use the “Law of Sines” to solve triangles if two adjacent sides and the angle opposite one of them are given (SSA).
- Students will combine skills in Geography, Geometry and Trigonometry to write their own original Ambiguous map problem for two cities with identical names.
- Students will make geometric constructions (especially perpendicular bisectors).
- Students will measure distances on a map and make proper conversions.
- Students will measure angles on a map.
- Students will demonstrate the ability to find locations on a map.
- Students will minimize computational errors and understand how estimates from rounding or measuring affect the amount of error that does occur.
- Students will informally prove the “Law of Cosines”.
- Students will solve triangles when the measure of two sides and the included angle are known (SAS) using the “Law of Cosines”.
- Students will solve triangles when the measures of three sides are known (SSS) using the “Law of Cosines”.
- Students will use the “Law of Cosines” to solve navigation problems.
- Students will find the area of a triangle given two sides and the included angle or one side and two angles.
- Students will use Heron’s formula to find the area of a triangle when the lengths of three sides are known.
- Students will measure angles of triangles with protractors.
- Students will calculate area of triangles using the “Law of Sines”, “Heron’s Formula”, “Divide and Conquer” and “Pick’s Method”.

Unit 4 Daily Lesson Plans

- Students will construct triangles from irregular shapes on Square Dot Paper.
- Students will use the “Monte Carlo” procedure to predict area via probability.
- Students will analyze solutions from the different procedures for calculating area to decide the accuracy of their results.
- Students will calculate area of circular segments using area of sectors and area of triangles formulas.