Leonia School District

Mathematics - Trig Analysis

Course Description

This course is intended for Seniors who want to reinforce and review essential math skills needed for college placement tests as well as introductory college math courses. Topics include right triangle trigonometry and its applications; data analysis; the normal curve; and basic probability.

Pacing Guide

Time Frame	Unit Title
11 Weeks	Trigonometry
8 Weeks	Exploring Data
8 Weeks	Normal Curve
7 Weeks	Probability
3 Weeks	Set Theory

Born on:
Board Approved:
Readopted:

Unit 1 - Trigonometry

Goals/Objectives of Unit:

- 1.) Draw an angle in standard position in the coordinate plane. Both positive and negative angles.
- 2.) Find the reference angle and/or coterminal angles given the measure of an angle.
- 3.) Draw the triangle in the coordinate plane for an angle in standard position having a given ordered pair on its terminal side.
- 4.) Find the values of the trigonometric functions for an angle in standard position having a given ordered pair on its terminal side.
- 5.) Find the missing side or angle of a right triangle using one of the six trigonometric functions.
- 6.) Solve applied/word problems involving right triangle trigonometry.
- 7.) Find the missing side or angle of an oblique triangle using the law of sines or cosines.

Core Instructional Resources/Materials:

Mathematical Ideas

- Textbook

Achieve the Core Coherence Map

NJ-Student Learning Standards:

HSG-SRT.C.6. Understand that by similarity, side ratios in right triangles are properties of the angles in the triangle, leading to definitions of trigonometric ratios for acute angles.
HSG-SRT.C.7. Explain and use the relationship between the sine and cosine of complementary angles.
HSG-SRT.C.8. Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems.

HSG-SRT.D.10. (+) Prove the Laws of Sines and Cosines and use them to solve problems.
HSG-SRT.D.11. (+) Understand and apply the Law of Sines and the Law of Cosines to find unknown measurements in right and non-right triangles (e.g., surveying problems, resultant forces).

Unit 2 - Exploring Data

Goals/Objectives of Unit:

- Construct and interpret graphical displays of data such as boxplots, dotplots, stemplots, histograms.
- Summarize distributions of data. This includes finding the center as well as measuring and describing the spread of the data.
- Compare distributions of data using dotplots, back-to-back stemplots, and boxplots.

Core Instructional Resources/Materials:

Mathematical Ideas

- Textbook

Achieve the Core Coherence Map

NJ-Student Learning Standards:

HSS-ID.A.1. Represent data with plots on the real number line (dot plots, histograms, and box plots).
HSS-ID.A.2. Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets.

HSS-ID.A.3. Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).

Unit 3 - Normal Curve

Goals/Objectives of Unit:

- Find and interpret the standardized score (z) of an observation
- Use percentiles to locate individual scores within distributions
- Understand the concept of areas under density curves and what they represent
- Locate median and mean on a density curve, based on its shape
- Recognize the shape of a normal distribution
- Use the 68-95-99.7 rule to locate data in a normal distribution
- Use the standard normal distribution to locate data using the z-score
- Find proportion of data lying within certain intervals,
- Find a point that splits a normal distribution into a certain proportion, given the mean and standard deviation

Core Instructional Resources/Materials:

Mathematical Ideas

- Textbook

Achieve the Core Coherence Map

NJ-Student Learning Standards:

HSS-ID.A.4. Use the mean and standard deviation of a data set to fit it to a normal distribution and to estimate population percentages. Recognize that there are data sets for which such a procedure is not appropriate. Use calculators, spreadsheets, and tables to estimate areas under the normal curve.

Unit 4 - Probability

Goals/Objectives of Unit:

- 1.) Interpret probability.
- 2.) Apply addition and multiplication rules for probability
- 3.) Understand the concept of conditional probability
- 4.) Find conditional probabilities.
- 5.) Find conditional probabilities.
- 6.) Understand difference between dependence and independence.

Core Instructional Resources/Materials:

Mathematical Ideas

- Textbook

Achieve the Core Coherence Map

NJ-Student Learning Standards:

HSS-ID.A.4. Use the mean and standard deviation of a data set to fit it to a normal distribution and to estimate population percentages. Recognize that there are data sets for which such a procedure is not appropriate. Use calculators, spreadsheets, and tables to estimate areas under the normal curve.

Unit 5 - Set Theory

Goals/Objectives of Unit:

- 1.) Understand what a set is and that there are various types of sets.
- 2.) Understand and use set theory notation.
- 3.) Find the cardinality of a set
- 4.) Find the complement of a set.
- 5.) Know the difference between what subset is versus a proper subset.Find a subset and/or a proper subset of a set.
- 6.) Find the union of two sets.
- 7.) Find the intersection of two sets.
- 8.) Find the difference of two sets.
- 9.) Place elements of a given sets in the proper locations of a Venn diagram.
- 10.) Interpret a given Venn diagram.

Core Instructional Resources/Materials:

Mathematical Ideas

- Textbook

Achieve the Core Coherence Map

NJ-Student Learning Standards:

HSS-CP.A.1. Describe events as subsets of a sample space (the set of outcomes) using characteristics (or categories) of the outcomes, or as unions, intersections, or complements of other events ("or," "and," "not").

General Assessments (may include but not limited to):

Possible Summative Assessment:

- Unit/Chapter tests
- Midterm/Final Exam
- Illustrative Math - Returning to Fred's Fun Factory
- Achieve the Core Coherence Map - assessment tools

Optional Daily Assessment:

- Exit ticket/survey (game/web-based: Kahoot!, Pear Deck, EdPuzzle, Plickers, Quizizz, FlipGrid, Google Suite)
- Reflection/self-assessment tool
- Graphic organizers
- Anecdotal notes/teacher observations