West Linn–Wilsonville School District

Mathematics – Course Statement

Course Title: Trigonometry

Length of Course: Year
Number of Credits: 1
Grade Level: 10, 11, 12
Prerequisites: Advanced Algebra

Date of Description/Revision: 2013

Course Overview

This course includes the study of relations, functions, and their graphs; the solving of equations both algebraically and graphically; the study of specific families of functions and their properties such as polynomial, rational, logarithmic, exponential, and trigonometric; and investigation of conic sections, complex numbers, vectors, polar and parametric equations, sequences and series, and matrices. A heavy emphasis on graphing utilities leads to the development of conceptual understanding.

Essential Questions

Concepts providing focus for student learning

- What are the similarities and differences between different families of functions and relations, their inverses and their graphs?
- How can we collect and analyze data to make logical arguments?
- What real-world problems can be solved with the tools of functions, statistics, and trigonometry?

Common Core Standards For Mathematical Practice

Students will develop the following practices throughout the course:

- Make sense of problems and persevere in solving them.
- Reason abstractly and quantitatively.
- Construct viable arguments and critique the reasoning of others.
- Model with mathematics.
- Use appropriate tools strategically.
- Attend to precision
- Look for make use of structure.
- Look for and express regularity in repeated reasoning.

Proficiency Statements

Upon completion of course, students will be able to:

- Explore and research mathematical applications in each unit of study.
- Develop the language and symbolism to communicate mathematically.
- Make and test conjectures, formulate counter-examples, follow logical arguments, and discuss the validity of arguments being presented.
- Recognize the connections among various mathematical topics and their applications.
- Calculate measure of center and spread for data.

- Use statistics to describe data sets and make conclusions about the populations from which the data came.
- Read and construct bar, box, and circle graphs.
- Find and interpret linear and quadratic models.
- Find the composites and inverses of functions algebraically and graphically.
- Apply the graph translation and graph scale change theorems to functions and their graphs.
- Solve exponential and logarithmic equations.
- Solve problems with trigonometric ratios, law of sines and cosines, and theorems about sines, cosines, and tangents.
- Solve equations involving circular functions and graph transformations of circular functions.
- Use probability, the counting theorem, permutations, and combinations to solve problems.
- Use sequences and series to solve problems.
- Apply the Remainder Theorem, Factor Theorem, Fundamental Theorem of Algebra, and conjugate Zero's Theorem.
- Factor polynomials; construct and interpret polynomials that model real world situations.

General Course Topics/Units & Timeframes

<u>Semester 1</u>

A. Exploring data
B. Functions and models
C. Transformations of graphs and data
D. Circular functions
E. Trig functions
F. Root, power and log functions

<u>Semester 2</u>

G. Probability and simulation
H. Statistics
I. Sequences, series and combinations
J. Polynomial functions
K. Binomial and normal distributions
L. Matrices and trig
M. Quadratic relations
N. More trigonometry

Resources

- Text: *Contemporary Trigonometry, A Graphing Approach, 1st Edition*, Hungerford, Brooks/Cole, 2006

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