



LINCOLN-WOODSTOCK COOPERATIVE SCHOOL DISTRICT COURSE SYLLABUS

Course Name: Precalculus

Length: Full Year

Teacher: Jessica Halm

Course Description:

Topics in this course include polynomial, rational, trigonometric, logarithmic, and exponential functions and their graphs; trigonometry and the unit circle; trigonometric identities; composite and inverse functions; logarithmic and exponential equations; solution of higher degree equations; and quadratic, rational, and absolute value inequalities.

Competencies or Standards Assessed:

1. **Symbolic Expression:** Students will reason abstractly and manipulate symbolic expressions and models to represent relationships and interpret expressions, equations, and inequalities in terms of a given context (including real-world phenomena) for determining unknown values.
2. **Numbers and Number Systems:** Students will expand their understanding of number systems, thinking flexibly and attending to precision and reasonableness, when solving problems using complex numbers.
3. **Reasoning and Computational Strategies:** Students will expand the use of computational strategies and algorithms, using evidence to support authentic application.
4. **Metacognitive Skills and Communication:** Students will use reasoning and metacognitive skills to develop mathematical arguments to justify the reasonableness of conjectures and outcomes and to support formal proofs.
5. **Measurement:** Students will explain reasoning when applying and modeling geometric measurement formulas.
6. **Algebraic Functions, Patterns, and Relations:** Students will make use of patterns, relations, and functions to interpret, compare, and analyze pure and applied situations, using the information to make conjectures and support conclusions.
7. **Geometry:** Students will solve problems involving spatial reasoning using properties of 2- and 3-dimensional figures to analyze, represent, and model geometric relationships in pure/theoretical and authentic applied contexts.

Anchor Texts or Major Curriculum:

Demana, Waits, Foley, Kennedy. Precalculus: Graphical, Numerical, Algebraic.

TI-89 Graphing Calculator (available for long-term loan) or similar model (see instructor for approval).

Course Outline (major units of study):	
Unit Title	Essential Question or Overarching Understanding
Unit P: Prerequisites	Review of Foundational Concepts: Properties of Algebra, Properties of Equality and Inequality, Distance and Midpoint Formulas, Quadratic Formula, Completing the Square, Linear Equations, Equations of a Circle
Unit 1: Functions and Graphs	How can we determine if a relation is a function? How can we describe functions? How are functions related to their inverses? How can we recognize function transformations?
Unit 2: Polynomial, Power, and Rational Functions	What is the correlation coefficient, and what does it tell us about the appropriateness of a mathematical model? What are all of the ways we can analyze polynomial functions? What is the significance of complex numbers? What does the graph of a rational function look like, and why? How can we transform rational functions?
Unit 3: Exponential, Logistic, and Logarithmic Functions	What are all of the ways we can analyze exponential and logarithmic functions? How are logarithmic and exponential functions related to one another? What are the properties of logarithms, and how can they be used to solve logarithmic equations?
Unit 4: Trigonometric Functions	What are the right-triangle trigonometric ratios, and how are they useful? How can this understanding be incorporated into understanding the Unit Circle? How can we use angles and trig ratios to determine arc length? What do the graphs of the 6 trig functions look like? What do the arcsin, arccos, and arctan function graphs look like?
Unit 5: Analytic Trigonometry	What are the basic trigonometric identities? How can we use trig identities to prove expression equivalence? What are some applications for using the laws of sines and cosines?



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Unit 6: Applications of Trigonometry

What are vectors, and why are they important for many real-world applications? How can parametric equations be used to model the path of an object in the air? What are polar coordinates, and how can they be used to simplify rectangular equations?

Portrait of a Learner

Independent Learner

I make thoughtful plans and do my best to reach personal goals using feedback to work through challenges.

Responsible Collaborator

I work with others to achieve shared goals by listening actively, contributing ideas, and managing conflict.

Critical Thinker

I analyze information, ask thoughtful questions, and apply reasoning skills to solve problems and make decisions.

Effective Communicator

I express ideas clearly, adapting strategies based on the audience, setting, and/or purpose.

Global Citizen

I show that I care and take responsibility by helping in my community and the world around me.

Additional Classroom Expectations:

Homework (Formatives):

- assigned daily Monday-Thursday via Google Classroom
- accounts for 20% of your overall grade each quarter
- checked and graded based on visually apparent effort, or by randomly selected problem submission
- Students who have fallen behind due to absences, etc., should use the weekends to get caught up

Quizzes, Tests, Written Summaries, Presentations, and Projects (Summatives):

- account for 80% of the overall grade each quarter
- Individual quiz and test responses will be evaluated based on the above rubric
- presentations, written summaries, and projects have their own separate evaluation rubric
- Traditional tests/quizzes are open notes

- may be corrected for an improved grade (see “Corrections” below)

Summative Corrections:

- Resubmit the original summative, with corrections attached to the front
- Corrections must be made for ***each and every problem/portion for which the student lost points***
- Complete corrections are consistent with a “4” on the above rubric
- notes, classmate, and/or teacher assistance may be used for corrections
- Corrections are due no later than 1 week after the summative is graded and returned to the student

Equipment:

- writing utensil, straightedge, textbook, and preferred note-taking system.
- TI-89 graphing calculators are available for short and long-term loan, course dependent.