

# Grand Island Public Schools

## PRECALCULUS

**Course Length:** Two semesters

**Grade Levels:** 11, 12

**Prerequisite Courses:** Algebra 3-4

### Course Description:

This course develops proficiency in advanced mathematical concepts using graphing calculators. The course emphasizes calculus-based concepts.

### Precalculus Course Standards

**As a result of their participation in this course, students will:**

#### Strand 1: Communicating Mathematical Thinking

- Build new mathematical knowledge through problem solving. (Problem Solving)
- Apply and adapt a variety of appropriate strategies to solve problems. (Problem Solving)
- Recognize and use connections among mathematical ideas and/or apply in contexts outside of mathematics. (Connections)
- Investigate, develop, and evaluate mathematical arguments and proofs. (Reasoning and Proof)
- Select, apply, and move fluently among mathematical representations to solve problems. (Representation)

#### Strand 2: Number and Operations

- Add, subtract, multiply, and divide complex numbers.

#### Strand 3: Algebraic Concepts

- Apply properties of relations and functions, including composition and inverses.
- Use matrices to solve equations.
- Solve, graph, and interpret nonlinear equations (rational, polynomial, variations, exponential).
- Solve and graph radical fractions.
- Estimate x-and y- intercepts on a graph.
- Graph quadratic functions and inequalities to determine the maxima, minima, and zeros of the function.
- Choose the correct domain and range for a given function, formula, situation or viewing window.
- Apply quadratic equations to physical problems.
- Graph and interpret trigonometric functions.
- Evaluate and graph inverse trigonometric functions.
- Use trigonometric identities to solve trigonometric equations.

#### Strand 4: Geometry, Spatial Concepts, and Measurement

- Recognize equivalency and work flexibly with degree and radian measurements.
- Solve, graph, and interpret quadratic equations (ellipse and hyperbola).
- Understand and use central angles, coterminal angles, and reference angles in both degrees and radian measures.
- Evaluate the six trigonometric functions.
- Solve triangles and find the area of triangles.

#### Strand 5: Data Analysis, Probability, and Statistics