

Pre-Calculus  
Fall 2018  
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Tutoring Times Fall 2018: Tuesday & Thursday 4:15 – 5:15 pm

**Course Description:**

In Pre-Calculus, students continue to build on the k-8, Algebra I, Algebra II and Geometry foundations as they expand their understanding of mathematics. Students will use functions, as well as, symbolic reasoning to represent and connect ideas in geometry, probability, statistics, trigonometry and calculus to model physical situations. Finally, students will use a variety of representations (concrete, pictorial, numerical, symbolic, graphical, and verbal), tools and technology (including, but not limited to calculators with graphing capabilities, data collection devices and computers) to model functions and equations and solve Real-Life problems.

**Course Objective:**

Pre-Calculus students will acquire and demonstrate knowledge of concepts, definitions, properties and applications of topics listed below. The main goal of Pre-Calculus is to help students obtain critical thinking and decision making skills that will allow them to connect concepts, develop computational skills and learn strategies needed to solve mathematical problems.

**Grading Policy:**

60% Major Assignments (Exams)

40% Minor Assignments (Daily Classwork, Homework & Quizzes)

**\*\*see district grading policy for specifications\*\***

**Required Materials:**

- Binder
- Pencils/Pens

**Expectations:**

- Be on time and be prepared.
- Bring all materials to class.
- Be prepared and ready to work as soon as the bell rings.
- Sit quietly and be attentive while the teacher is addressing the class.
- Stay in your seat during class time and raise your hand to be recognized.
- Turn in assignments on time (no late work will be accepted).
- Ask for any missed work due to an excused absence.
  - If absent during test day, you will be able to take the test before or after school only.
- Follow all school rules at all times.
- Stay on task until the bell rings. The teacher dismisses the class, not the bell.
- Take notes every day and keep a neat and well organized binder.

- There will be no food or drinks allowed in class.
- Cell phones are not allowed in class unless otherwise specified by the teacher

## **Chapter 1      Graphs**

- 1.1 The Distance and Midpoint Formulas
- 1.2 Intercepts: Symmetry: Graphing Key Equations
- 1.3 Solving Equations Using a Graphing Utility
- 1.4 Lines
- 1.5 Circles

## **Chapter 2      Functions and Their Graphs**

- 2.1 Functions
- 2.2 The Graph of a Function
- 2.3 Properties of Functions
- 2.4 Library of Functions: piecewise-defined Functions
- 2.5 Graphing Techniques: Transformations
- 2.6 Mathematical Models: Building Functions

## **Chapter 3      Linear and Quadratic Functions**

- 3.1 Linear Functions and Their Properties
- 3.2 Linear Models: Building Linear Functions from Data
- 3.3 Quadratic Functions and Their Properties
- 3.4 Build Quadratic Models from Verbal Descriptions and from Data
- 3.5 Inequalities Involving Quadratic Functions

## **Chapter 4      Polynomial and Rational Functions**

- 4.1 Polynomial Functions and models
- 4.2 The Real Zeros of a Polynomial Function
- 4.3 Complex Zeros: Fundamental Theorem of Algebra
- 4.4 Properties of Rational Functions
- 4.5 The Graph of a Rational Function
- 4.6 Polynomial and Rational Inequalities

## **Mid Term Exams**

## **Chapter 5 Exponential and logarithmic Functions**

- 5.1 Composite Functions
- 5.2 One-to-One Functions: Inverse Functions
- 5.3 Exponential Functions
- 5.4 Logarithmic Functions
- 5.5 Properties of Logarithms
- 5.6 Logarithmic and Exponential Equations
- 5.7 Financial Models
- 5.8 Exponential Growth and Decay Models
- 5.9 Building Exponential, Logarithmic, and Logistic Models

## **Chapter 6 Trigonometry Functions**

- 6.1 Angles and Their Measure
- 6.2 Trigonometric Functions: Unit Circle Approach

- 6.3 Properties of the Trigonometric Functions
- 6.4 Graphs of Sine and Cosine Functions
- 6.5 Graphs of the Tangent, Cotangent, Cosecant, and Secant Functions
- 6.6 Phase Shift: Sinusoidal Curve Fitting

### **Chapter 7 Analytic Trigonometry**

- 7.1 The inverse Sine, Cosine, and Tangent Functions
- 7.2 The Inverse Trigonometric Functions (Continued)
- 7.3 Trigonometric Equations
- 7.4 Trigonometric Identities

### **Chapter 8 Applications of Trigonometric Functions**

- 8.1 Right Triangle Trigonometry: Applications
- 8.2 The Law of Sines
- 8.3 The Law of Cosines
- 8.4 Area of Triangle
- 8.5 Simple Harmonic Motion; Damped Motion: Combining Waves

**\*\*\*If time permits, then the following lessons will be cover\*\*\***

### **Chapter 9 Polar Coordinates; Vectors**

- 9.1 Lines
- 9.2 Polar Equations and Graphs
- 9.3 The Complex Plane; De Moivre's Theorem

### **Chapter 12 Sequences; Induction; the Binomial Theorem**

- 12.1 Sequences
- 12.2 Arithmetic Sequences; Geometric Series
- 12.3 Geometric Sequences; Geometric Series

### **Chapter 14 A Preview of Calculus: The Limit, Derivative, and Integrals**

- 14.1 Finding Limits Using Tables and Graphs
- 14.2 Algebra Techniques for Finding Limits
- 14.3 One-Sided Limits; Continuous Functions
- 14.4 The Area Problem; The Derivative
- 14.5 The Area Problem; The Integral