EAGLE MOUNTAIN SAGINAW ISD
Curriculum and Instruction

OnRamps Pre-Calculus Parent Guide

1st Six Weeks

Unit 1: Functions, Rates, & Patterns

Unit 1 Concepts:

In this Unit, students will focus on functions, rates, and patterns. Students will work with multiple representations and attributes of functions, inverses, and compositions of functions. They will work with real-world data to create piece-wise functions, determine rates of change, look for patterns and connect them to general functions.

Learning Goals:

Students will be able to use multiple representations to define a function – including composition of functions, inverses, and graphs. They will be able to find the domain and range of functions and understand the relationship between the domain and range of a function and its inverse.

Why? – Math is patters and understanding patterns can provide the basis for understanding algebra.

2nd Six Weeks

Unit 2: Algebra & Geometry

Unit 2 Concepts:

In this Unit, students will focus on the relationships between Algebra and Geometry. They will work with different forms of conic equations to find different components, use matrices to model, graph, and solve real-world applications. Students will also evaluate and solve problems involving complex roots and model real-world data with best fit functions.

Learning Goals:

Students will create graphs of functions by performing transformations on the parent function, graph conics given the equation of the conic in standard form, and model conics using matrices. They will solve real world problems using conics and by using linear regression and residual plots.

Why? – Students will explore how conics are used to solve real-world problems.

3rd Six Weeks

Unit 3: Exponential & Logarithmic Functions

Unit 3 Concepts:

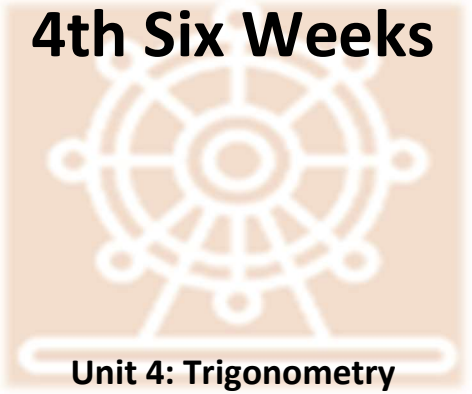
In Unit 3, students will study exponential and logarithmic functions and equations. They will formulate equations that represent real-world situations, solve equations, transform functions, and convert between logarithmic and exponential form. Students will use real-world examples to explore exponential growth and decay, predict the long-term behavior of a variable in a model of exponential growth or decay, use the inverse relationship of logarithmic and exponential function to solve problems, be able to graph, evaluate, or solve the logistic function.

Learning Goals:

Students will be able to simplify, evaluate and solve exponential and logarithmic functions. They will use inverse properties to solve problems.

Why? – Exponential and Logarithmic functions are used extensively to solve financial problems.

4th Six Weeks



Unit 4: Trigonometry

Unit 4 Concepts:

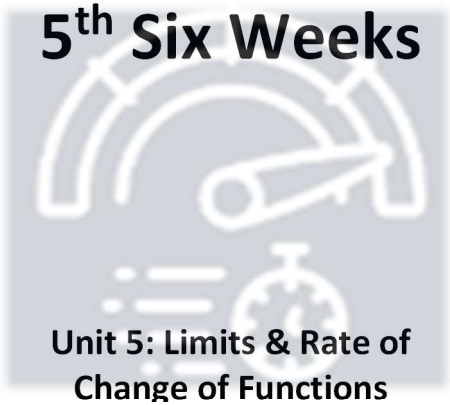
In Unit 4, students will use trigonometric (trig) identities to simplify, evaluate and solve trig expressions, work with graphs of trig functions, explore angular and linear velocity, understand cofunctions, derive and apply the Law of Cosines and the Law of Sines.

Learning Goals:

Students will construct the Unit Circle, evaluate trig functions using their knowledge of the Unit Circle, understand the relationship between radians and degrees, use trig identities to simplify expressions, understand reference angles, use transformations to graph trig functions, and understand inverse trig functions.

Why? – Students will learn how to use trigonometry to visualize and solve real-world problems.

5th Six Weeks



Unit 5: Limits & Rate of Change of Functions

Unit 5 Concepts:

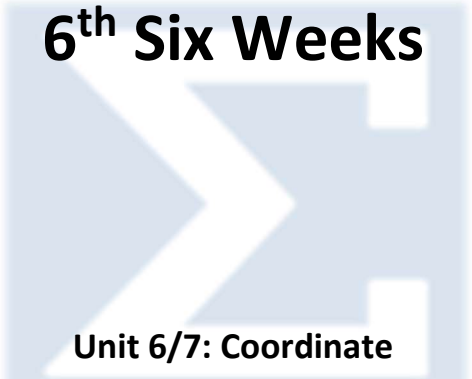
In Unit 5, students will investigate and explain the key features, end behavior and discontinuities of graphs and rational functions. Students will explore the definition of limits using graphs and apply the limit of a function.

Learning Goals:

Students will graph rational functions using x-intercepts, y-intercept, end behavior and discontinuities. They will understand the definition using graphs and tables. They will solve real-world problems using average rate of change and instantaneous rate of change. They will calculate the instantaneous rate of change of a function using the difference quotient and will understand the relationship between average rate of change and instantaneous rate of change. They will also use the derivative to solve real-world problems.

Why? - Students will be introduced to calculus concepts of derivatives and limits to prepare for future math.

6th Six Weeks



Unit 6/7: Coordinate Systems, Sequences & Series

Unit 6 / 7 Concepts:

In this Unit, students will understand how different coordinate systems are related. Students will convert between rectangular relations and parametric equations, convert between Cartesian and polar coordinates, apply the properties of vectors and radians to compare the Polar and Cartesian coordinate systems, and graph polar equations by relating to graphs of rectangular functions, and will work with sequences and series.

Learning Goals:

Students will understand the relationship between distance and coordinate location. They will use table sand graphs to explore parametric equations, converter rectangular equations to parametric equations, and solve real-world problems using parametric equations. Students will learn vector addition and scalar multiplication.

Why? - Students will understand the relationships between various coordinate systems.

Questions? Please contact your OnRamps Pre-Calculus teacher. **Additional Support:** We recommend Khan Academy and VarsityTutors.com and remember campus tutoring is also available.