# Pre-Calculus

# 1st Semester Learning Targets

| | GP Learning Target | Topic | Description | Textbook Reference |
|---|---|---|---|---|
| **Unit 1: Functions and Graphs** | 1A | Basic Graphs and Regression | I can identify quadratic and linear correlations in data and use technology to define an appropriate quadratic regression functions. | 1.1 and 1.2 |
| | 1B | Domain, Range, and Number Sets | I can describe a set of numbers in a variety of ways. | 2.4 |
| | 1C | Piecewise-Defined Functions | I can define, interpret, and use piecewise functions in function notation and as a graph. | 1.2 |
| | 1D | Rates of Change and Behavior of Graphs | I can determine the average rate of change for a function as well as identify increasing and decreasing functions and intervals. | 1.3 |
| **Unit 2: Polynomial Functions** | 2A | Quadratic Equations with Complex Solutions | I can solve quadratic equations with complex solutions by factoring, quadratic formula, and completing the square. | 3.2 |
| | 2B | Completing the Square and the Vertex Formula | I can identify key features of a parabola from its vertex form equation, and by converting a quadratic function from standard form to vertex form. | 3.3 |
| | 2C | Graphing Polynomial Functions and modeling | I can identify the extrema, symmetry, and zeros of polynomial functions and use them to graph and model with these functions. | N/A |
| | 2D | Polynomial Equations And the Fundamental Theorem of Algebra | I can describe and apply the Fundamental Theorem of Algebra to find real and complex solutions of polynomial equations. | 3.4-3.6* |
| **Unit 3: Rational Functions** | 3A | Simplifying and Solving Rational Equations | I can simplify and solve rational equations. | 3.7* |
| | 3B | Graphing Basic Rational Functions | I can graph rational functions and identify their asymptotes. | |
| | 3C | Graphing Advanced Rational Functions | I can graph advanced rational functions including functions with slant asymptotes and multiple vertical asymptotes. | |
| **Unit 4: Exponential and Logarithmic Functions** | 4A | Graphing Exponential | I can graph and describe transformations for exponential functions. | 4.2 |
| | 4B | Graphing Logarithmic Functions | I can graph and describe transformations for logarithmic functions. | 4.5 |
| | 4C | Solving problems with Exponential | I can solve problems involving exponential functions. | 4.1 |
| | 4D | Solving problems with Logarithmic Functions | I can solve problems involving logarithmic functions with properties. | 4.3/4.4 |
| **Unit 5: Systems of Equations and Inequalities** | 5A | Systems of Equations in Two Variables | I can solve and apply systems of linear and nonlinear equations in two variables. | N/A |
| | 5B | Systems of Linear Equations in Three Variables | I can solve and apply systems of linear equations in three variables using substitution, elimination, and matrices | N/A |
| | 5C | Systems of Non-Linear Inequalities in Two Variables | I can solve and apply systems of nonlinear inequalities in two variables. | N/A |
| **Unit 6: Conic Sections** | 6A | Conic Sections | I can write the equation for and graph circles, ellipses, and hyperbolas. | N/A |
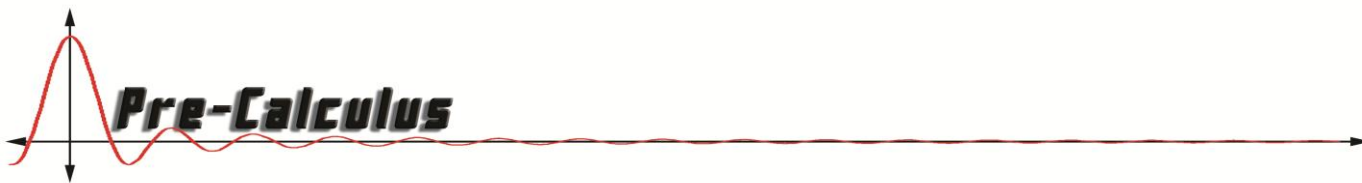
# Pre-Calculus

# 2nd Semester Learning Targets

| | GP Learning Target | Topic | Description | Textbook Reference |
|---|---|---|---|---|
| **Unit 7: Trigonometric Functions** | 7A | Angles and Radian Measure | I can accurately use radian measures to define angles and find arc lengths. | 5.2 |
| | 7B | Trigonometry Functions and Angles | In can solve problems by applying the 6 trigonometric functions to the sides of a right triangle. | 5.5 |
| | 7C | The Unit Circle and the Circular Functions | I can find the values of the Sine and Cosine on the 16 point Unit circle and apply them to solve problems involving all 6 trigonometric functions. | 5.3/5.4 |
| | 7D | Law of Sines and Cosines | I can solve problems using the Law of Sines and the Law of Cosines. | 8.1 |
| **Unit 8: Graphs of Trigonometric Functions** | 8A | Graphs of Sinusoids | I can create and use graphs of transformations of sine and cosine functions to solve problems. | 6.1 |
| | 8B | Graphs of the other Trigonometric Functions | I can create and use the graphs of transformations of non-sinusoid trig. functions (csc, sec, tan, cot) to solve problems | 6.2 |
| | 8C | Graphing Inverse Trigonometric Functions. | I can create and use graphs of transformations of inverse trigonometric functions to solve problems. | 6.3 |
| | 8D | Composite Graphs of Trigonometric Functions | I can create and use graphs of transformations of composite trigonometric functions to solve problems. | 7.4 |
| **Unit 9: Analytic Trigonometry** | 9A | Fundamental Trigonometric Identities | I can use and apply fundamental trigonometric identities. | 7.1 |
| | 9B | Proving Trigonometric Identities | I can prove trigonometric identities. | 7.2 |
| | 9C | Angle Sum and Difference identities | I can use and apply sum and difference identities. | 7.2 |
| | 9D | Multiple Angle Identities | I can use and apply multiple angle identities. | 7.3 |
| **Unit 10: Vector, Parametric, and Polar Graphs** | 10A | Vectors in the Plane | I can represent, model with, and perform operations on vector quantities. | 8.4 |
| | 10B | Dot Products of Vectors | I can apply the dot product of vectors to solve problems. | N/A |
| | 10C | Polar Coordinates and Graphs | I can locate points, create graphs, and analyze graphs in the polar coordinate system. | 8.2 |
| | 10D | Parametric Equations and Motion | I can create, interpret, and apply parametric equations. | 8.5 |