

Math 153: Trigonometry and Precalculus Student Learning Outcomes

By the end of the semester, students should be able to

(SLO#1) **Use Correct Mathematical Notation and Terminology** Use equal sign properly. Label axes and point on graphs labeled accurately and clearly. Give mathematical arguments or explanations that are organized and stated in complete sentences where appropriate.

(SLO#2) **Graph and Interpret Functions:** Sketch and interpret graphs in context of applications; apply appropriate transformations for the following: polynomial functions (linear, quadratic, followed by those with degree three and higher), trigonometric functions, exponential and logarithmic functions, rational functions, parametric equations, and conic sections. Be able to create and graph piece-wise functions from all of the above. Create graphs to model situations.

(SLO#3) **Perform Operations on Functions (as listed in SLO #2):** Be able to use function notation to evaluate expressions and perform operations on functions such as addition, subtraction, multiplication, division, composition and difference quotients of functions. Be able to find the domain and range of functions as well as their inverses (if they exist).

(SLO#4) **Analyze the Behavior of Functions (as listed in SLO #2):** Be able to determine the end behavior and intercepts of functions. Be able to determine extreme values of functions and intervals where functions increase or decrease. Apply this analysis to interpreting an applied problem.

(SLO#5) **Solve Equations:** Be able to solve exponential, logarithmic, trigonometric, quadratic, radical, and rational equations. Also be able to solve linear and non-linear systems of equations. Be able to interpret solutions in context of applications.

(SLO#6) **Solve Applied Problems:** Be able to set up models from word problems using appropriate functions or laws. This includes modeling with linear, quadratic, rational, exponential, logarithmic and trigonometric functions.

(SLO#7) **Perform Operations with Complex Numbers and Vectors:** Be able to determine the trigonometric and polar form of a complex number. Be able to add vectors in two dimensions, project vectors onto one another, and determine the angles between vectors. Use vectors and complex numbers to solve applied problems.