

Math 11022 - Trigonometry Learning Outcomes

Knowledge

Express angles in both degree and radian measure.

Solve right and oblique triangles in degrees and radians for both special and non-special angles.

Represent trigonometric and inverse trigonometric functions verbally, numerically, graphically and algebraically; define the six trigonometric functions in terms of right triangles and the unit circle.

Perform transformations of trigonometric and inverse trigonometric functions – translations, reflections and stretching and shrinking (amplitude, period and phase shift).

Analyze the algebraic structure and graph of trigonometric and inverse trigonometric functions to determine intercepts, domain, range, intervals on which the function is increasing, decreasing or constant, asymptotes, whether the function is one-to-one, whether the graph has symmetry (even/odd), etc., and given the graph of a function to determine possible algebraic definitions.

Solve a variety of trigonometric and inverse trigonometric equations, including those requiring the use of the fundamental trigonometric identities in degrees and radians for both special and non-special angles. Solve application problems that involve such equations.

Identify and express the conics (quadratic equations in two variables) in standard rectangular form, graph the conics, and solve applied problems involving conics.

Represent vectors graphically in both rectangular and polar coordinates.

Perform basic vector operations both graphically and algebraically – addition, subtraction and scalar multiplication.

Insight

Use trigonometric functions to model a variety of real-world problem solving applications.

Understand the difference between a trigonometric function and an inverse trigonometric function. Understand the relationship among the solutions of a trigonometric equation in one variable, the zeros of the corresponding function, and the coordinates of the x-intercepts of the graph of that function.

Verify trigonometric identities by algebraically manipulating trigonometric expressions using fundamental trigonometric identities.

Solve application problems that involve right and oblique triangles.

Understand the conceptual and notational difference between a vector and a point in the plane.

Solve application problems using vectors.

Engagement

Consider and explain the role of trigonometry in understanding science and social problems

Improve their confidence in and attitude toward trigonometry because of the course.

Participate actively in class discussions.

Responsibility

Develop confidence and competence in communicating mathematical knowledge to peers.

Develop conceptual understanding and fluency with trigonometric functions, techniques, and manipulations necessary for success in Calculus.