# Pre-Calculus Midterm Study Guide

**Chapter 2 (10 Questions = 29%)**

Identify the vertex of a quadratic function.
Determine the equation of a quadratic graph in standard form given its vertex and another point.
Divide a polynomial equation using long or synthetic division.
Use synthetic substitution to evaluate a variable for a polynomial function.
Use a graphing utility to find all the rational zeros of a polynomial function.
Find all the zeros of a polynomial function.
Add or subtract two complex numbers and simplify in standard form.
Multiply two complex numbers and simplify in standard form.
Write a quotient involving complex numbers in standard form.
Identify the vertical and horizontal asymptotes for a rational function.

**Chapter 3 (8 Questions = 23%)**

Evaluate a logarithmic or exponential expression.
Use the change of base formula to evaluate a logarithm.
Condense a logarithmic expression.
Expand a logarithmic expression.
Solve an exponential equation.
Solve a logarithmic equation.
Solve an exponential equation algebraically by factoring.
Apply an exponential growth or decay model to an application based problem.

**Chapter 4 (7 Questions = 20%)**

Determine one positive and one negative coterminal angle.
Rewrite an angle in exact radians (in terms of pi).
Given the value of a trigonometric function, find another trigonometric function's value given the quadrant.
Given a point, determine the value of a specific trigonometric function.
Determine in which quadrant an angle lies given parameters of $> 0$ or $< 0$ of two trigonometric functions.
Find the period of a trigonometric equation.
Find the exact value of a composition of trigonometric functions (including an inverse function).

**Chapter 5 (10 Questions = 29%)**

Use trigonometric identities to simplify an expression.
Develop a triangle using two trigonometric identities to determine a third trigonometric identity.
Simplify using the co-function identities.
Simplify a complex trigonometric equation.
Find all solutions of a trigonometric equation within an interval.
Find an exact value using the sum and difference formulas.
Find an exact value using the sum and difference formulas given u and v.
Find an exact value using the double angle formulas.
Simplify an expression using the half-angle formulas.
Write a sum as a product using the sum-to-product formulas.