IM 3 First Semester Final Exam

Topics and Assessment Objectives

Polynomial Operations (4 Questions)

- *Completely factor a given polynomial.*
- *Add, subtract and multiply polynomials.*

Function Operations and Inverse Functions (4 Questions)

- Find the inverse of a function.
- *Perform basic function operations including finding composite functions.*

Quadratic Functions (3 Questions)

- *Determine how the values of a, h, and k affect the graph of a function in $y = a(x-h)^2 + k$ form.*
- *Find the vertex of a quadratic function.*
- *Graph a quadratic function.*
- *Use the discriminant to determine the number of real solutions a quadratic has.*
- *Understand the benefit of the three forms of a quadratic function, General Form, Vertex Form and Factored Form.*

Radical Functions (3 Questions)

- *Determine the range and domain of a radical function.*
- *Graph a radical function.*

Rational Expressions (4 Questions)

- *Add and subtract rational expressions involving polynomials by finding a common denominator.*
- *Simplify rational expressions by factoring numerator and denominator and reducing.*

Rational Functions (3 Questions)

- *Find the vertical asymptotes of a rational function.*
- *Find the domain of a rational function.*
- *Graph a rational function.*

Complex Numbers (3 Questions)

- *Simplify expressions involving imaginary or complex numbers.*
- *Multiply and divide complex numbers.*
- *Add and subtract complex numbers.*
- *Rationalize an expression with complex numbers in the denominator.*

Polynomial Division (1 Question)

- *Find the quotient of a division problem involving polynomials using the polynomial long division method.*
- *Find the quotient of a division problem involving polynomials using the synthetic division method.*

Polynomial Functions (7 Questions)

- *Use the rational zero test to determine all possible rational zeros of a polynomial function.*
- *Use the rational zero test to determine all possible roots of a polynomial equation.*
- *Find all zeros of a polynomial function.*
- *Use the remainder theorem to evaluate the value of functions.*
- *Write a polynomial in completely factored form.*
- *Find the equation of a polynomial function that has the given zeros.*
- *Determine the left and right behaviors of a polynomial function without graphing.*
- *Find all x intercepts of a polynomial function.*
- *Graph a polynomial function.*
- *Determine the solution of a system of polynomial functions by graphing.*