

# Advanced Functions 12 • MHF 4U University Preparation

The Ontario Curriculum Grade 11 Mathematics 2007

Mathematics • Malvern C.I. • Toronto District School Board

Assistant Curriculum Leader: Elizabeth Barsby

Course developed by: Math Department • Revised: Elizabeth Barsby, Jeff Eschle Year: 2021

Credit Value: 1

## Course Content

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**Description** This course enables students to broaden their understanding of real world applications of mathematics. Students will analyze data using statistical methods; solve problems involving applications of geometry and trigonometry; solve financial problems connected with annuities, budgets, and renting or owning accommodation; simplify expressions and solve equations. Students will reason mathematically and communicate their thinking as they solve multi-step problems. This course prepares students for college programs in areas such as business, health sciences, and human services, and for certain skilled trades.

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**Prerequisite** Functions and Relations, Grade 11, University Preparation;

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**Resource Materials** • *Advanced Functions 12, McGraw Hill 2003*

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**Overall Goals** By the end of this course, students will:

- Identify and describe some key features of polynomial functions, and make connections between the numeric, graphical, and algebraic representations of polynomial functions;
- Identify and describe some key features of the graphs of rational functions, and represent rational functions graphically;
- Solve problems involving polynomial and simple rational equations graphically and algebraically;
- Demonstrate an understanding of solving polynomial and simple rational inequalities;
- Demonstrate an understanding of the meaning and application of radian measure;
- Make connections between trigonometric ratios and the graphical and algebraic representations of the corresponding trigonometric functions and between trigonometric functions and their reciprocals, and use these connections to solve problems;
- Solve problems involving trigonometric equations and prove trigonometric identities;
- Demonstrate an understanding of the relations between exponential expressions and logarithmic expression, evaluate logarithms, and apply the laws of logarithms to simplify numeric expressions;
- Identify and describe some key features of the graphs of logarithmic functions, make connections among the numeric, graphical, and algebraic representations of logarithmic functions, and solve related problems graphically;
- Solve exponential and simple logarithmic equations in one variable algebraically, including those in problems arising from real-world applications;
- Demonstrate an understanding of average and instantaneous rate of change, and determine, numerically and graphically, and interpret the average rate of change of a function at a given point;
- Determine functions that result from the addition, subtraction, multiplication, and division of two functions and from the composition of two functions, describe some properties of the resulting functions, and solve related problems;
- Compare the characteristics of functions, and solve problems by modeling and reasoning with functions, including problems with solutions that are not accessible by standard algebraic techniques.

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**Major Units**

- Polynomial Functions
- Polynomial Equations and Inequalities
- Rational Functions
- Trigonometry

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- Trigonometric Functions
- Exponential and Logarithmic Functions
- Combining Functions

## Assessment, Evaluation and Reporting

- Strategies**
- Students will have the opportunity to learn and be assessed before evaluations.
  - Tests, quizzes, in-class activities and assignments will be used.

Achievement Category Weightings	Knowledge / Understanding	Thinking	Communication	Application
	35%	15%	15%	35%

- Term Grades throughout the Year**
- The grade for each reporting period is based on evaluations that have been conducted to that point in the course, and will be preliminary and tentative. They will be based on the most consistent level of achievement to that point in time, but some of the overall expectations, strands, and units will not have been addressed. The student's grades will most likely change when his/her entire work is evaluated at the end of the course.

- Course Work 80%**
- Components of Evaluations: (refer to evaluation plan for details)
    1. Tests
    2. Quizzes
    3. Assignments
  - Students need to demonstrate achievement of overall course expectations
  - Missed or incomplete assignments will have an impact on the final grade when a significant number of curriculum expectations have not been evaluated.

- Course-Culminating Activities 20%**
- Culminating Activity

- Learning Skills**
- Learning skills play a critical role in the achievement of curriculum expectations and student success.
  - Students are expected to be academically honest by submitting their own original work. The marks they receive are intended to reflect their own academic achievement.

## Communication

- Consultation**
- The phone number for the mathematics department at Malvern is: (416)393-1480 extension 20080

- Help**
- Please approach your teacher to make arrangements for extra help in the morning, at lunch, or after school.