Functions, Grade 11 ● MCR3U

University preparation

The Ontario Curriculum Grades 11 and 12 Mathematics 2007

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

Curriculum Leader: Elizabeth Barsby

Course developed by: Ms. E. Barsby , Mr. J. Eschle   •   **Revised:** September 2021

Credit Value: 1

Course Content

Description	*This course introduces the mathematical concept of the function by extending students' experiences with linear and quadratic relations. Students will investigate properties of discrete and continuous functions, including trigonometric and exponential functions; represent functions numerically, algebraically, and graphically; solve problems involving applications of functions; investigate inverse functions; and develop facility in determining equivalent algebraic expressions. Students will reason mathematically and communicate their thinking as they solve multi-step problems.*
Prerequisite	Principles of Mathematics, Grade 10, Academic
Resource Materials	*Functions 11* (Nelson, 2008)
Overall Goals	By the end of this course students will: · demonstrate an understanding of functions, their representations, and their inverses, and make connections between the algebraic and graphical representations of functions using transformations; · determine the zeroes and the maximum or minimum of a quadratic function, and solve problems involving quadratic function, including problems arising from real-world applications; · demonstrate an understanding of equivalence as it relates to simplifying polynomial, radical, and rational expressions; · evaluate powers with rational exponents, simplify expressions containing exponents, and describe properties of exponential functions represented in a variety of ways; make connections between the numeric, graphical, and algebraic representations of exponential functions; · identify and represent exponential functions, and solve problems involving exponential functions, including those arising from real-world applications; · demonstrate an understanding of recursive sequences, represent recursive sequences in a variety of ways, and make connections to Pascal's triangle; · demonstrate an understanding of the relationships involved in arithmetic and geometric sequences and series, and solve related problems; · make connections between sequences, series, and financial applications, and solve problems involving compound interest and ordinary annuities; · determine the values of the trigonometric ratios for angles less than 360°; prove simple trigonometric identities; and solve problems using the primary trigonometric ratios, the sine law, and the cosine law; · demonstrate an understanding of periodic relationships and sinusoidal functions, and make connections between the numeric, graphical, and algebraic representations of sinusoidal functions; · identify and represent sinusoidal functions, and solve problems involving sinusoidal functions, including problems arising from real-world applications.

Major Units	●	Properties of Functions
	●	Algebraic skills
	●	Transformations of Functions
	●	Quadratic Functions and Equations
	●	Trigonometry
	●	Trigonometric Functions
	●	Exponential Functions
	●	Discrete Functions

Assessment, Evaluation and Reporting

Strategies	● Student work will be assessed on an on-going basis.
	● Students will have the opportunity to learn and be assessed before evaluations.
	● Tests, mini-tests, 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:
	1. Tests, quizzes
	2. 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%	● Performance Tasks (Two – part activity)
	● All students must take part in the culminating activities.

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.
	● Please refer to *Malvern Mathematics Policy for Learning Skills* for more details.

Communication

Consultation	● (416)393-1480 extension 20080

Help	•	Extra help is available daily by the classroom teacher. Please approach your teacher to schedule times for extra-help.