PICKERING HIGH SCHOOL

Enter to learn. Go forth to serve.

The Durham District School Board is committed to learning and working environments that centre human rights and equity and are safe, welcoming, respectful, equitable, accessible, inclusive, and free from discrimination.

Pickering High School encourages the growth of involved, responsible, and educated citizens by developing the skills and positive attitudes necessary for life-long learning in our rapidly changing world.

Course Title	Grade 11		
Course Name	Functions		
Teacher/Department	Mathematics		
Contact Information	905-683-4760		
Ministry of Education Curriculum	https://www.edu.gov.on.ca/eng/curriculum/secondary/math1112currb.pdf#page=45		
Course Code	MCR 3U	**Course Type**	University
Credit Value	1.0	**Prerequisite Course(s)**	MPM 2D **(Recommended minimum mark 70%)**

Course Information:

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.

Resource Materials:

Textbook – Functions 11 (eBook)

Materials Required - Binder containing:

a) Lined paper and graph paper
b) Ruler, pencils, pens, eraser
c) Non-programmable scientific calculator

Recommended Calculators: Sharp EL531 or Casio-**fx**-300**MS** or TI30X

We acknowledge that the Durham Region forms a part of the traditional and treaty territory of the Mississauga's of Scugog Island First Nation, the Mississauga Peoples, and the Chippewas of Georgina Island First Nation. It is on these ancestral and treaty lands that we teach, learn, and live.

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Overall Curriculum Expectations:

Characteristics of Functions

1) demonstrate an understanding of functions, their representations, and their inverses, and make connections between the algebraic and graphical representations of functions using transformations;
2) determine the zeros and the maximum or minimum of a quadratic function, and solve problems involving quadratic functions, including problems arising from real-world applications;
3) demonstrate an understanding of equivalence as it relates to simplifying polynomial, radical, and rational expressions.

Exponential Functions

1) evaluate powers with rational exponents, simplify expressions containing exponents, and describe properties of exponential functions represented in a variety of ways;
2) make connections between the numeric, graphical, and algebraic representations of exponential functions;
3) identify and represent exponential functions, and solve problems involving exponential functions, including problems arising from real-world applications.

Discrete Functions

1) demonstrate an understanding of recursive sequences, represent recursive sequences in a variety of ways, and make connections to Pascal's triangle;
2) demonstrate an understanding of the relationships involved in arithmetic and geometric sequences and series, and solve related problems;
3) make connections between sequences, series, and financial applications, and solve problems involving compound interest and ordinary annuities

Trigonometric Functions

1) determine the values of the trigonometric ratios for angles less than 360º; prove simple trigonometric identities; and solve problems using the primary trigonometric ratios, the sine law, and the cosine law;
2) demonstrate an understanding of periodic relationships and sinusoidal functions, and make connections between the numeric, graphical, and algebraic representations of sinusoidal functions;
3) identify and represent sinusoidal functions, and solve problems involving sinusoidal functions, including problems arising from real-world applications.

Course Outline

Unit 1: Introduction to Functions
Unit 2: Equivalent Algebraic Expressions
Unit 3: Quadratic Functions
Unit 4: Trigonometric Ratios
Unit 5: Sinusoidal Functions
Unit 6: Exponential Functions
Unit 7: Discrete Functions
Unit 8: Financial Applications

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Teaching Strategies:

- Clear expectations
- Direct Instruction
- Small Group Instruction
- Flexible Groupings
- Deliberate Practice
- Math Conversations
- Descriptive Feedback
- Teaching about Problem Solving
- Math Tools and Manipulatives

Assessment and Evaluation Summary:

Assessment will be varied in nature and administered over a period to provide multiple opportunities for students to demonstrate the full range of their learning. The final grade should reflect the student's most consistent level of achievement, with special consideration given to more recent evidence. (*Growing Success, 2010*)

Term Work (70%)	Summative Work (30%)
Tests – 45% Quizzes – 15% Assignments – 10%	Final Examination – 20% Culminating Assignment – 10%

These assessments incorporate the following categories: Knowledge/Understanding, Applications, Communication, Thinking/Inquiry/Problem Solving.

Students should review school assessment and evaluation policies and procedures carefully. Students should complete all assigned assessment tasks (i.e. projects, presentations, homework assignments, etc.) by the due date outlined by the teacher. Late assignments may be subject to a late penalty per day, at the discretion of the teacher. To maintain the integrity of assessments and/or evaluations, once the teacher has handed back work, late submissions may not be accepted, and the student may receive a mark of zero.