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##### 2018 – 2019

##### Grade 11, University/College Preparation

### Functions and Applications

MCF3M1

**Evaluation Profile & Outline**

## Earl Haig

SecondarySchool

**Course Description/Rationale/Overview:**

This course introduces basic features of the function by extending students’ experiences with quadratic relations. It focuses on quadratic, trigonometric, and exponential functions and their use in modelling real-world situations. Students will represent functions numerically, graphically, and algebraically; simplify expressions; solve equations; and solve problems relating to applications. Students will reason mathematically and communicate their thinking as they solve multi-step problems.

**Class Requirements:**

Materials/textbook/equipment

Textbook (supplied):

Functions and Applications 11

Nelson

Replacement textbook cost: $90

Calculator

Notebook and materials for note-taking

**Course Requirements/Department Policies**

Late Assignments

Late assignments must be accompanied with a note signed by a parent or guardian stating the reason for late submission. The note must list the due date of the assignment and the actual date of submission.

**Marks will be deducted for late assignments, up to and including the full value of the assignment.** [Growing Success: Assessment, Evaluation, and Reporting in Ontario Schools, Ministry of Ontario, 2010, pg. 43.]

Missed Tests

Arrangements for missed tests for valid reasons must be made ahead of time if known in advance, or the teacher must be contacted on the day of the test by phone (395-3210 ext. 20080) in case of illness or other unexpected absence. The student should be prepared to write the test immediately upon return to school.

#### Assessment Strategies

Diagnostic Quizzes Homework Check

Diagnostic Tests Group Work

In-class Assignments Technology Based Tasks

Peer Assessments Observations

Class Participation/Interaction

Conferences/Interviews

**Mathematical Process Expectations**

Problem Solving Connecting

Reasoning and Proving Representing

Reflecting Communicating

Selecting Tools and Computational Strategies

**Learning Skills:**

* Responsibility
* Initiative
* Organization
* Independent Work
* Collaboration
* Self-regulation

**Curriculum strands:**

* Quadratic Functions
* Exponential Functions
* Trigonometric Functions

FINAL MARK

Year’s Work: 70%

Final Exam 30%

Achievement Categories and Weighting

Knowledge & Understanding 25%

Application 20%

Thinking 10%

Communication 15%

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**UNIT 1: QUADRATIC FUNCTIONS**

**1. Function Notation**

* Definition of relation and function, function notation
* Domain and range (including restrictions on domain), real life applications

**2. Transformations**

* Investigate the quadratic function and its transformation (with technology)
* Graph quadratic functions (without technology), identify key features

**3. Factoring and Application of Quadratics**

* Review expanding and simplifying binomials
* Express a quadratic function in  and 
* Factoring
* Solve quadratic equations by factoring, relate real roots to the x-intercept(s)

**4. Solving Quadratic Equations by Graphing**

* Sketch the graph of quadratic function by factoring
* Completing the squares
* Maximum and Minimum problems

**5. Quadratic Formula**

* Apply quadratic formula to solve quadratic equations
* Discriminant
* Selecting appropriate strategies to solve quadratic equations
* Collect data that can be modeled as quadratic function, quadratic of best fit

**UNIT 2: TRIGONOMETRIC FUNCTIONS**

**1. Solving Triangles Using Trigonometry**

* Review primary trigonometric ratios
* Solve problems involving two right triangles in two dimensions
* Investigate and apply The Sine Law and The Cosine Law (using acute triangles only)

**2. Trigonometric Functions**

* Key properties of periodic functions arising from real-world applications
* Graph  (with and without technology, angles measured in degrees)
* Transformation of sine functions and identify key properties
* Solve problems involving sine functions

**UNIT 3: EXPONENTIAL FUNCTIONS**

**1. Exponent Laws**

* Integral and rational exponents
* Graph ,  and describe key properties
* Distinguish exponential functions from linear and quadratic in different ways
* Application and problem solving of exponential functions (growth and decay)

**2. Financial Math**

* Simple interest and compound interest, introduction of TVM Solver
* Present value and ordinary annuity
* Exploration of annuities involving earning and paying interest