

Course Outline

Course Name: Functions and Applications

Course Code: MCF 3M

Teacher: Ms. Henry

Course Type: Grade 11 Mixed

Course Description:

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.

Overall Expectation:

Quadratic Functions	<ol style="list-style-type: none">1. expand and simplify quadratic expressions, solve quadratic equations, and relate the roots of a quadratic equation to the corresponding graph;2. demonstrate an understanding of functions, and make connections between the numeric, graphical, and algebraic representations of quadratic functions;3. solve problems involving quadratic functions, including problems arising from real-world applications.
Exponential Functions	<ol style="list-style-type: none">1. simplify and evaluate numerical expressions involving exponents, and make connections between the numeric, graphical, and algebraic representations of exponential functions;2. identify and represent exponential functions, and solve problems involving exponential functions, including problems arising from real-world applications;3. demonstrate an understanding of compound interest and annuities, and solve related problems.
Trigonometric Functions	<ol style="list-style-type: none">1. solve problems involving trigonometry in acute triangles using the sine law and the cosine law, including problems arising from real-world applications;2. demonstrate an understanding of periodic relationships and the sine function, and make connections between the numeric, graphical, and algebraic representations of sine functions;3. identify and represent sine functions, and solve problems involving sine functions, including problems arising from real-world applications.

Course Breakdown

Unit 1	Factoring
Unit 2	Solving Quadratic Equations
Unit 3	Graphing Quadratic Functions
Unit 4	Exponents
Unit 5	Exponential Functions
Unit 6	Interest and Annuities
Unit 7	Trigonometry of Triangles
Unit 8	Trigonometric Functions

Assessment and Evaluation Strategies:

The purpose of assessment and evaluation is to improve student learning. Assessment and evaluation is based on the provincial curriculum expectations and the achievement levels outlined in the curriculum document.

70% of the grade will be based upon evaluations conducted throughout the course. This portion of the grade will reflect the student's most consistent level of achievement throughout the course, although special consideration will be given to more recent evidence of achievement.

30% of the grade will be based on a final evaluation administered at the end of the course. This final evaluation will be based on an evaluation of achievement from all four categories of the Achievement Chart for the course and of expectations from all units of the course.

Achievement Chart Categories
• Knowledge/Understanding
• Thinking/Inquiry
• Communication
• Application

Process Expectations:

These expectations are integrated into all areas of the course.

Problem Solving • develop, select, apply, compare, and adapt a variety of problem-solving strategies as they pose and solve problems and conduct investigations, to help deepen their mathematical understanding

Reasoning and Proving • develop and apply reasoning skills (e.g., use of inductive reasoning, deductive reasoning, and counter-examples; construction of proofs) to make mathematical conjectures, assess conjectures, and justify conclusions, and plan and construct organized mathematical arguments

Reflecting • demonstrate that they are reflecting on and monitoring their thinking to help clarify their understanding as they complete an investigation or solve a problem (e.g., by assessing the effectiveness of strategies and processes used, by proposing alternative approaches, by judging the reasonableness of results, by verifying solutions)

Selecting tools and computational strategies • select and use a variety of concrete, visual, and electronic learning tools and appropriate computational strategies to investigate mathematical ideas and to solve problems

Connecting • make connections among mathematical concepts and procedures, and relate mathematical ideas to situations or phenomena drawn from other contexts (e.g., other curriculum areas, daily life, current events, art and culture, sports)

Representing • create a variety of representations of mathematical ideas (e.g., numeric, geometric, algebraic, graphical, pictorial representations; onscreen dynamic representations), connect and compare them, and select and apply the appropriate representations to solve problems

Communicating • communicate mathematical thinking orally, visually, and in writing, using precise mathematical vocabulary and a variety of appropriate representations, and observing mathematical conventions.

Learning Skills:

These skills are included as a formal part of the assessment and evaluation process. These skills will be formally reported on the Report Card according to the following scale: E – Excellent, G – Good, S – Satisfactory, N – Needs Improvement.

1. Responsibility
2. Organization
3. Independent Work
4. Collaboration
5. Initiative
6. Self-Regulation