



OTTAWA
CATHOLIC
SCHOOL BOARD

Grade 11 University Functions MCR3U

Inspired education.
Inspiring students.

Prerequisite Course: Principles of Mathematics Grade 10, Academic

Description and Overall Expectations: This course introduces the mathematical concept of the function by extending students' experiences with linear and quadratic relations. Students will 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.

Math Processes: problem-solving, reasoning and proving, reflecting, selecting tools and computational strategies, connecting, representing, and communicating.

Characteristics of Functions: 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 zeros and the maximum or minimum of a quadratic function, and solve problems involving quadratic functions, including problems arising from real-world applications; demonstrate an understanding of equivalence as it relates to simplifying polynomial, radical, and rational expressions.

Exponential Functions: evaluate powers with rational exponents, simplify expressions containing exponents, and describe properties of exponential functions; make connections between the numeric, graphical, and algebraic representations of exponential functions; identify and represent exponential functions, and solve problems involving exponential functions, including problems arising from real-world applications.

Discrete Functions: demonstrate an understanding of recursive sequences, represent them 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; make connections between sequences, series, and financial applications, and solve problems involving compound interest and ordinary annuities.

Trigonometric Functions: 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 them, including problems arising from real-world applications.

Course Resources: See teacher and school for the list of key resources, digital tools, sites, passwords, including replacement cost for resources if lost or damaged.

Catholic Graduate Expectations: Our goal for all students is to experience an education based on our Catholic Graduate Expectations.

We work in community to develop graduates that are:

- Discerning Believers Formed in the Catholic Faith Community
- Effective Communicators
- Reflective and Creative Thinkers
- Self-Directed, Responsible, Life-Long Learners
- Collaborative Contributors
- Caring Family Members
- Responsible Citizens

<http://www.iceont.ca>

Assessment, Evaluation and Reporting: The primary purpose of assessment and evaluation is to improve student learning. Students will understand what is expected of them, using learning goals, and success criteria, based on the overall expectations. Feedback (self, peer, teacher) supports learning, and plays a critical role in academic achievement and success.

The development of learning skills and work habits is a key indicator of future success. The following learning skills and work habits will be developed, assessed, and reported during this course:

1. Responsibility fulfills responsibilities and commitments (*e.g. accepts and acts on feedback*)
2. Organization manages time to complete tasks and achieve goals (*e.g. meets goals, on time*)
3. Independent work uses class time appropriately to complete tasks (*e.g. monitors own learning*)
4. Collaboration works with others, promotes critical thinking (*e.g. provides feedback to peers*)
5. Initiative demonstrates curiosity and an interest in learning (*e.g. sets high goals*)
6. Self-Regulation sets goals, monitors progress towards achieving goals (*e.g. sets, reflects goals*)

Group work supports collaboration, an important 21st century skill. This will be assessed only as a learning skill. Homework may also be assessed as a learning skill. Evaluation completed in class will be based only on individual student work. Regular attendance is important to support group work, various forms of feedback, and to allow students to demonstrate evidence of their learning. Students are responsible for providing evidence of their own learning (with references where required), in class, within given timelines. Next steps in response to academic integrity issues, such as lack of work completion, plagiarism, or other forms of cheating, range from providing alternate opportunities, to a deduction of marks.

The achievement chart identifies four levels, based on achievement of the overall expectations:

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|---------|---|-----------|
| Level 1 | achievement falls below the provincial standard | (50-59%) |
| Level 2 | achievement approaches the provincial standard | (60-69%) |
| Level 3 | achievement is at the provincial standard | (70-79%) |
| Level 4 | achievement surpasses the provincial standard | (80-100%) |

The report card grade will be based on evidence of student performance, including observations, conversations and student products. Consideration will be given to more recent evidence (skill development) and the most consistent level of achievement.

Mark Breakdown:

Term Work (70%) will include a variety of rich assessment tasks designed to demonstrate students' development in their knowledge and understanding, thinking and inquiry, communication and application, of all overall expectations.

Summative evaluation (30%) takes place towards the end of the semester, is completed in class, and provides the final opportunity for students to demonstrate what they know, and the skills they have learned, based on the overall expectations. In Functions 3U Math, the summative evaluation will consist of a rich summative assessment task (10%) and a final exam (20%).

Awarding of Course Credit: Students who demonstrate evidence of achievement of overall expectations, **and** earn a mark of 50% or greater, will earn one credit for the course with the following exception:

Students who do not complete their summative evaluation (exam and/or end of year performance task) will not earn their credit regardless of their mark.

Student and Parent/Guardian Acknowledgement

We have read the above course outline and are aware of the student responsibilities to attend class on a regular basis and to provide evidence of learning within the established timelines.

Student's Name (print): _____ Student's Signature: _____

Parent/Guardian Name (print): _____ Parent/Guardian Signature: _____