

COURSE INFORMATION



DATE: February 2023

SCHOOL: Yeshiva High School of Ottawa

DEPARTMENT HEAD: N/A

TEACHER: Mr. David Jacobs

DEPARTMENT: General Studies, Maths and Sciences

CURRICULUM POLICY DOCUMENT		The Ontario Curriculum: Grades 11 and 12 – Mathematics (2007, revised)	
COURSE TITLE	Functions, Grade 11	COURSE CODE	MCR3U
PRE-REQUISITE	Principles of Mathematics, Grade 10, Academic	GRADE & TYPE	Grade 11 University
FULL YEAR / SEMESTER	Semester	CREDIT VALUE	1.0

COURSE 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.

UNIT DESCRIPTIONS:

UNIT 1 — FUNCTION NOTATION, INVERSES, AND TRANSFORMATIONS

TIME: 15 HOURS

Through authentic models, students are introduced to the definition of a function and the notations associated with it. Students use graphing technology and pencil-and-paper tasks to investigate the properties of functions and their inverses, and to apply transformations in the form $y = af(k(x-d))+c$ to the graphs of $f(x) = x$, $f(x) = x^2$, $f(x) = \frac{1}{x}$, and $f(x) = \sqrt{x}$. Students explore the domain and range of functions, inverses, and transformations. Students solve first-degree inequalities and graph their solutions on number lines.

UNIT 2 — EXPLORING FUNCTIONS: CONNECTING ALGEBRA AND GEOMETRY

TIME: 15 HOURS

UNIT 3 — TRIGONOMETRY

TIME: 13 HOURS

Students consolidate and extend concepts first introduced in Grade 10. Students use the primary trigonometric ratios, the sine law, and the cosine law to model and solve two- and three-dimensional problems involving acute, right, and oblique triangles. Students explore the use of the unit circle and special triangles to determine selected values of the primary trigonometric

ratios. Methods of proof are introduced and applied to verify trigonometric identities. Students develop the skills to manipulate and solve trigonometric equations.

UNIT 4 — TRIGONOMETRIC FUNCTIONS **TIME: 17 HOURS**

Students investigate the periodic nature and graphical properties of the primary trigonometric functions. Using technology, students explore the effects of simple transformations on their graphs and equations. Students apply these concepts to model authentic problems.

UNIT 5 — EXPONENTS AND THE EXPONENTIAL FUNCTION **TIME: 20 HOURS**

Students review and practice the different exponent laws that are used in the algebraic manipulation of functions and their terms. Students discover the nature of exponential functions and their graphs and practice connecting them to each other. Students will use graphical and algebraic means to solve exponential equations and related problems to the study of exponential functions.

UNIT 6 — DISCRETE FUNCTIONS **TIME: 25 HOURS**

Students investigate arithmetic and geometric sequences and series. This knowledge serves as the basis for applications of personal finance. Students investigate the Fibonacci sequence and Pascal’s triangle and apply what they have learnt about sequences and series. Students apply skills with linear and exponential functions.

UNIT 7 — FINAL SUMMATIVE ASSESSMENT **TIME: 5 HOURS**

STUDENT EVALUATION CRITERIA				
TERM – 70%		FINAL – 30%		FINAL REPORT CARD GRADE CALCULATION
Knowledge/Understanding	25%	Knowledge/Understanding	25%	TERM TOTAL + FINAL TOTAL = REPORT CARD MARK
Inquiry/Thinking	25%	Inquiry/Thinking	25%	
Communication	25%	COMMUNICATION	25%	
Application	25%	Application	25%	

ASSESSMENT METHODS		
OBSERVATIONS:	CONVERSATIONS:	PRODUCTS:
<ul style="list-style-type: none"> ● Informal presentations ● Reading skills ● Writing process steps (graphic organizers, research notes, outlines, drafts, editing checklists) ● Listening and speaking skills ● Self-assessment ● Records of practice including checklists, anecdotal notes (homework, classroom contributions, metacognition charts, notetaking) 	<ul style="list-style-type: none"> ● Peer feedback / editing ● Group work records ● Conferences (student- teacher, group) ● Classroom contributions ● Composition/ arrangements ● Response Journals 	<ul style="list-style-type: none"> ● Review quizzes ● Unit tests ● Projects ● Oral presentations ● Assignments ● Summative tasks ● Final Examination (30%)

LEARNING SKILLS
Report Cards will include a letter grade for the following Learning Skills:

INDEPENDENT WORK	The student: <ul style="list-style-type: none"> ▪ accomplishes tasks independently ▪ accepts responsibility for accomplishing tasks ▪ follows instructions ▪ regularly completes assignments on time and with care ▪ uses time effectively
	The student: <ul style="list-style-type: none"> ▪ works willingly and cooperatively with others ▪ listens attentively, without interrupting ▪ takes responsibility for his/her share of the work to be done ▪ helps to motivate others, encouraging them to participate ▪ shows respect for the ideas and opinions of others
	The student: <ul style="list-style-type: none"> ▪ organizes work when faced with a number of tasks ▪ devises and follows a coherent plan to complete a task ▪ demonstrates ability to organize and manage information ▪ follows an effective process for inquiry and research
	The student: <ul style="list-style-type: none"> ▪ completes homework on time and with care ▪ follows directions ▪ shows attention to detail ▪ perseveres with complex projects that require sustained effort ▪ applies effective study practices
	The student: <ul style="list-style-type: none"> ▪ seeks out new opportunities for learning ▪ seeks necessary and additional information ▪ requires little prompting to complete a task, ▪ approaches new learning situations with confidence and a positive attitude ▪ seeks assistance when needed
	The student: <ul style="list-style-type: none"> ▪ sets individual goals and monitors own progress ▪ seeks clarification or assistance when needed ▪ reflects and assesses critically own strengths, needs and interests ▪ perseveres and makes an effort when responding to challenges

NOTE: The above chart is a reformatting of the skills identified in the Ministry of Education's *Guide to the Provincial Report Card, Grades 9 – 12 : Appendix C: pages 27 to 29*.

POLICIES AND PROCEDURES	
ATTENDANCE	<p>The Ontario Ministry of Education requires 110 hours of instruction for each course. As such, it is essential for the students to arrive punctually to each class.</p> <p>Students arriving more than ten minutes late will be marked "Late" on their report card.</p> <p>Students who are absent for an acceptable reason (see below) still have to make up the number of hours missed under the supervision of a teacher or the principal according to their availability. It is the student's duty to determine and arrange this supervision, and YHSO does not guarantee teacher's or principal's availability.</p> <p><i>Students who are absent for non-acceptable reasons will forfeit their credit.</i></p> <p>ACCEPTABLE REASONS FOR ABSENCE</p> <ul style="list-style-type: none"> • Medical reason (may require a physician's note) • Family trips or special occasions (up to four missed classes per course)

	Regardless of reason for an absence, if a student misses more than 26 classroom hours they will forfeit their credit.
ASSIGNMENTS	<p>Students are responsible to complete all their assignments and homework on time. Teachers will write all assignments, homework and tests on a classroom board, along with their due dates, but students are accountable to complete these assessments punctually. Assignments handed in late may result in a deduction of marks.</p> <p>Teachers will post all assessments and assignments and their due dates on Google Classroom. Students and their parents will have access to the Google Classroom for their courses.</p>
BEHAVIOUR	<p>Students may not act in any manner that disrupts the education of another, or distracts a teacher. This includes:</p> <ul style="list-style-type: none"> • Excessive noise • Physical disruptions • Eating (unless granted individual permission) • Use of technology not for schoolwork purposes • Acts of disrespect such as name calling, abusive or offensive language or gestures <p>Failure to adhere to these rules will result in disciplinary action as described in the Student Handbook and Course Calendar.</p>
PLAGIARISM	<p>Academic integrity and honesty is expected from every student in Yeshiva High School of Ottawa. We take all instances of suspected dishonesty, plagiarism, or any form of “cheating” very seriously. A student who submits work that is, in whole or in part, plagiarized, will be subject to academic penalties. Repeated infractions may result in the loss of a credit and further disciplinary action. A student who assists another student in academic dishonesty may face academic consequences, including revocation of a credit.</p>