

Matthew Halton High School Math 30-1 Course Outline - Spring 2021

- Instructor: Colton Garner (garnerc@lrsd.ab.ca)
- Room 209
- Block 1 everyday
- 5 Credit Course

I should take...



Mathematics-1 If I want to study mathematics or sciences at a university, college, or technical institute and go on to a related career.

Mathematics-1 is for students who plan to enter post-secondary programs such as engineering, mathematics, sciences, some business studies, or other programs that require advanced math skills. The sequence is a co-requisite for Mathematics 31 and may be required for post-secondary calculus courses.

Mathematics-1 includes topics such as permutations and combinations, relations and functions, sequences and series, and trigonometry.



Mathematics-2 If I want to attend a university, college, or technical institute after high school, but do not need calculus skills.

Mathematics-2 is for students wishing to study at the post-secondary level in diverse fields, including arts programs, some engineering technologies, medical technologies, and some apprenticeship programs. This path will fulfill most students' needs. Mathematics-2 is designed with a great deal of flexibility, so that the student can switch sequences in Grade 11 or Grade 12 if his or her interests change.

Mathematics-2 includes topics such as relations, functions and equations, probability, statistics, and trigonometry.



Mathematics-3 If I am interested in learning the mathematics needed to enter most trades or if I want to enter the workforce after high school.

Mathematics-3 is for students who want to apprentice to a trade or enter the workforce directly after high school. It is designed to meet the entrance requirements for apprentices in most trades programs.

Mathematics-3 includes topics such as finance, geometry, measurement, and trigonometry.

For more information, visit www.education.alberta.ca/math



Course Content

The learner outcomes for Math 30-1 (as outlined later in the course outline) will be covered by studying three main topics.

- Topic 1: Trigonometry
 - Angles in Radians and Degrees, Unit Circle, Solving Trig Problems, Trig Functions, Trig Equations, Trig Identities
- Topic 2: Relations and Functions

- Composition of Functions, Translations of Functions, Stretches of Functions, Combinations of Stretches and Translations, Reflections of Functions, Inverse Relations, Logarithms, Laws of Logarithms, Exponential and Logarithmic Functions, Exponential and Logarithmic Equations, Factoring, Polynomial Functions, Radical Functions, Rational Functions
- Topic 3: Permutations, Combinations, and Binomial Theorem
- Fundamental Counting Principle, Permutations, Combinations, Binomial Theorem

Expectations

- Students are required to have access to a graphing calculator for use throughout the course. It is important that this calculator is used throughout high school so that students are familiar with the calculator functions before writing the diploma exam in grade 12. While Alberta Education allows the use of any graphing calculator from the approved list on the diploma exam (see below), **students are strongly encouraged to use a calculator from the Texas Instruments Series (particularly the TI-84)** as this is the calculator that will be demonstrated during class instruction. The current list of approved calculators, and the Alberta Education diploma exam calculator policy can be found at http://education.alberta.ca/media/6902701/06-dip-gib-2014-15_using_calculators-computers.pdf
- Use of the TI-Nspire calculator is **STRONGLY** discouraged.
- Students are **NOT** permitted to use cell phones, ipods, or other personal devices as calculators in class, on exams, or on the diploma exam.
- Use of personal electronic devices, such as ipods, cell phones, gaming devices, tablets, ipads, etc., is **NOT** permitted in class without prior permission.
- One Classroom Rule - RESPECT
 - For Self
 - For Others (Classmates, Teacher, Custodial and Other Staff)
 - For the Classroom

Resources

- *Pre-Calculus Grade 12 Workbook* - AVP 2012. Students are strongly encouraged to purchase the workbook for \$22 cash. They get to keep the book and write in it. It is extremely worth the money for each student. If purchasing a workbook is a problem please contact the teacher.
- *Pre-Calculus 12* – McGraw Hill Ryerson

Diploma Exam

This year will be different from previous years as students have the choice to write Diploma Exams. This is done on an individual basis and it is preferred that each student discuss this with school administration. Therefore if a student does not write a math 30-1 diploma exam they will write a final exam in place of it. The final exam will be school based and created by the teacher. Date is still to be determined.

Evaluation

Final grades will be calculated as follows:	Teacher Awarded Mark	Final Course Mark
Relations and Functions <ul style="list-style-type: none">• Transformations (15%)• Non Linear Functions (16%)• Exponents and Logs (15%)	50%	70%
Trigonometry	26%	
Permutations, Combinations, and Binomial Theorem	14%	
Cumulative Exams and Written Assessments	10%	
Diploma Exam	--	

Note – All coursework must be complete in order to receive credit for this course. Significant missing coursework will not be assigned a grade of zero if incomplete. Rather, the course will be designated as incomplete until all coursework is finished and an accurate grade can be calculated

Timeline of Topics (estimate and subject to change)

1. Transformations - 14 classes
2. Non-linear Functions - 16 classes
3. Exponents and Logs - 13 classes
4. Trigonometry - 14 classes
5. Perms and Combs - 10 classes
6. Course Review - 12 classes

Learning Outcomes

Math 30-1 consists of the following learner outcomes as outlined in the *Mathematics Program of Studies* set forth by *Alberta Learning*.

Trigonometry – Develop trigonometric reasoning.

T1. **Angles in Radians and Degrees** – Demonstrate an understanding of angles in standard position, expressed in degrees and radians.

T2. **Unit Circle** – Develop and apply the equation of the unit circle.

T3. **Solving Trig Problems** – Solve problems, using the six trigonometric ratios for angles expressed in radians and degrees.

T4. **Trig Functions** – Graph and analyze the trigonometric functions sine, cosine and tangent to solve problems.

T5. **Trig Equations** – Solve, algebraically and graphically, first and second degree trigonometric equations with the domain expressed in degrees and radians.

T6. **Trig Identities** – Prove trigonometric identities, using: reciprocal, quotient, Pythagorean, sum or difference (restricted to sine, cosine and tangent), and double-angle (restricted to sine, cosine and tangent) identities.

Relations & Functions – Develop algebraic and graphical reasoning through the study of relations.

RF1. **Composition of Functions** – Demonstrate an understanding of operations on, and compositions of, functions.

RF2. **Translations of Functions** – Demonstrate an understanding of the effects of horizontal and vertical translations on the graphs of functions and their related equations.

RF3. **Stretches of Functions** – Demonstrate an understanding of the effects of horizontal and vertical stretches on the graphs of functions and their related equations.

RF4. **Combinations of Stretches and Translations** – Apply translations and stretches to the graphs and equations of functions.

RF5. **Reflections of Functions** – Demonstrate an understanding of the effects of reflections on the graphs of functions and their related equations, including reflections through the: x -axis, y -axis, and line $y = x$.

RF6. **Inverse Relations** – Demonstrate an understanding of inverses of relations.

RF7. **Logarithms** – Demonstrate an understanding of logarithms.

RF8. **Laws of Logs** – Demonstrate an understanding of the product, quotient and power laws of logarithms.

RF9. **Exponential and Logarithmic Functions** – Graph and analyze exponential and logarithmic functions.

RF10. **Exponential and Logarithmic Equations** – Solve problems that involve exponential and logarithmic equations.

RF11. **Factoring** – Demonstrate an understanding of factoring polynomials of degree greater than 2 (limited to polynomials of degree less than or equal to 5 with integral coefficients).

RF12. **Polynomial Functions** – Graph and analyze polynomial functions (limited to polynomial functions of degree less than or equal to 5).

RF13. **Radical Functions** – Graph and analyze radical functions (limited to functions involving one radical).

RF14. **Rational Functions** – Graph and analyze rational functions (limited to numerators and denominators that are monomials, binomials or trinomials).

Permutations, Combinations and Binomial Theorem – Develop algebraic and numeric reasoning that involves combinatorics.

PC1. Fundamental Counting Principle – Apply the fundamental counting principle to solve problems.

PC2. Permutations – Determine the number of permutations of n elements taken r at a time to solve problems.

PC3. Combinations – Determine the number of combinations of n different elements taken r at a time to solve problems.

PC4. Binomial Theorem – Expand powers of a binomial in a variety of ways, including using the binomial theorem (restricted to exponents that are natural numbers).