




**Matthew Halton High School**  
**Math 30-1**  
**Course Outline**  
**Fall 2019**  
**Instructor: B. Whitford**

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### ***General Information***


- Math 30-1 – 5 Credits
- Instructor – B. Whitford
  - [whitfordb@lrsd.ab.ca](mailto:whitfordb@lrsd.ab.ca)
  - (403)627-4414
  - Room 209
- Class Schedule: Block 3
  - Monday – Thursday
    - 12:49 PM to 2:07 PM
  - Thursdays during P2S
    - 10:01 AM to 10:41 AM
  - Friday
    - 11:07 AM to 12:09 PM

*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.

## ***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 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](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*
- *Pre-Calculus 12 – McGraw Hill Ryerson*

## Diploma Exam

In order to receive credit for Math 30-1, all students must write a diploma exam. This exam accounts for 30% of each students final course mark. The other 70% is based on the teacher awarded mark for the course. The diploma exam is scheduled for

**Wednesday, January 22<sup>nd</sup>, from 9AM to 12PM.** The exam has written, multiple choice and numeric response type questions. These exams are created and secured by Alberta Education, and thus are NOT available outside of the scheduled times. Teachers do not have the opportunity to preview the exams prior to students writing them. Diploma exams must be administered according to the scheduled dates and time. It is imperative that students are aware of the date and are on time for this exam. Students who do not write the exam are awarded a mark of 0 for the exam, which is then averaged in accordingly with the teacher awarded mark.

## Evaluation

Final grades will be calculated as follows:

	Teacher Awarded Mark	Final Course Mark
Relations and Functions <ul style="list-style-type: none"><li>• Transformations (15%)</li><li>• Non Linear Functions (16%)</li><li>• Exponents and Logs (15%)</li></ul>	50%	70%
Trigonometry	26%	
Permutations, Combinations, and Binomial Theorem	14%	
Cumulative Exams and Written Assessments	10%	
Diploma Exam	--	30%

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 – Math 30-1

Timeline is approximate and therefore, subject to change.

### September 2019

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	<del>27</del>	28
29	30					

Transformations  
Non Linear Functions  
Sept 27 – PD Day

### October 2019

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	<del>11</del>	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

...Non Linear Functions  
Exponents and Logs  
Experiential Learning Week  
Oct 14 – Thanksgiving Day  
Oct 11 – PD Day

### November 2019

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	<del>8</del>	9
10	<del>11</del>	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

...Exponents and Logs  
Trigonometry  
Nov 8 – PD Day  
Nov 11 – Remembrance Day

### December 2019

S	M	T	W	T	F	S
1	2	3	4	5	<del>6</del>	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

...Trigonometry  
Perms and Combs  
Christmas Break  
Dec 6 – PD Day

### January 2020

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

Christmas Break  
Review  
Jan 23 – Last Day of Classes  
Jan 22 – Diploma (Math)

## Outcomes

### Transformations

- RF2 Translations
- RF3 Stretches
- RF4 Combinations
- RF5 Reflections
- RF6 Inverse Functions

### Non-Linear Functions

- RF1 Composition of Functions
- RF11 Factoring
- RF12 Polynomial Functions
- RF13 Radical Functions
- RF14 Rational Functions

### Exponents and Logs

- RF7 Logarithms
- RF8 Laws of Logs
- RF9 Exponential and Logarithmic Functions
- RF10 Exponential and Logarithmic Equations

### Trigonometry

- T1 Angles in Radians and Degrees
- T2 Unit Circle
- T3 Trig Problems
- T4 Trig Functions
- T5 Trig Equations
- T6 Trig Identities

### Perms and Combs

- PC1 Fundamental Counting Principle
- PC2 Permutations
- PC3 Combinations
- PC4 Binomial Theorem

## **Learning Outcomes**

Math 30-1 is comprised 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).