General Information

- Math 20-1 – 5 Credits
- Instructor – B. Whitford & C. Garner
  - whitfordb@lrsd.ab.ca
  - garnerc@lrsd.ab.ca
  - (403)627-4414
  - Room 209

- Class Schedule: Block 4
  - Monday – Thursday
    - 2:12 PM to 3:30 PM
  - Thursdays during P2S
    - 10:01 AM to 10:41 AM
  - Friday
    - 12:14 PM to 1:16 PM

Mathematics 20-1 is a pre-requisite for Math 30-1.

I should take...

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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.

Alberta Government

Course Content

The learner outcomes for Math 20-1 (as outlined later in the course outline) will be covered by studying three main topics.

- Topic 1: Algebra and Number
  - o Absolute Value, Radicals, Radical Equations, Equivalent Forms of Rational Expressions, Operations on Rational Expressions, Rational Equations
- Topic 2: Trigonometry
  - o Angles, Sine, Cosine, Tangent, Sine Law, Cosine Law
- Topic 3: Relations and Functions
  - o Factoring, Absolute Value Functions, Quadratic Functions in Standard Form, Quadratic Functions in General Form, Quadratic Equations, Systems of Equations, Inequalities, Quadratic Inequalities, Arithmetic Sequences and Series, Geometric Sequences and Series, Reciprocal Functions

Resources

Pre-Calculus Grade 11 Workbook - AVP 2011

- Students are able to purchase their own copy of this workbook for $20. If they choose to purchase their own copy, they can write in the book throughout the semester and keep it once the course is finished.

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
  ***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
  - o For Self
  - o For Others (Classmates, Teacher, Custodial and Other Staff)
  - o For the Classroom

Timeline

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	Factoring and Radicals
15	16	17	18	19	20	21	
22	23	24	25	26	27	28	Quadratics
29	30						Sept 27 – PD Day

October 2019

S	M	T	W	T	F	S	
		1	2	3	4	5	…Quadratics
6	7	8	9	10	11	12	
13	14	15	16	17	18	19	Systems and Inequalities
20	21	22	23	24	25	26	
27	28	29	30	31			Experiential Learning Week
							Oct 11 – PD Day Oct 14 - Thanksgiving

November 2019

S	M	T	W	T	F	S	
					1	2	
3	4	5	6	7	8	9	Absolute Value and Reciprocal Functions
10	11	12	13	14	15	16	
17	18	19	20	21	22	23	Rationals
24	25	26	27	28	29	30	
							Nov 8 – PD Day Nov 11 – Remembrance Day

December 2019

S	M	T	W	T	F	S	
							Dec 6 – PD Day
1	2	3	4	5	6	7	Sequences and Series
8	9	10	11	12	13	14	
15	16	17	18	19	20	21	Trigonometry
22	23	24	25	26	27	28	Christmas Break
29	30	31					

January 2020

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

Outcomes

Radicals & Factoring
201-RF1 Factoring
201-AN2 Radicals
201-AN3 Radical Equations

Quadratics
201-RF3 Quadratic Functions in Standard Form
201-RF4 Quadratic Functions in General Form
201-RF5 Quadratic Equations

Systems & Inequalities
201-RF6 Systems of Equations
201-RF7 Inequalities
201-RF8 Quadratic Inequalities

Trigonometry
201-T1 Angles
201-T2 Sine, Cosine, and Tangent
201-T3 Sine and Cosine Law

Rationals
201-AN4 Equivalent Forms of Rational Exp.
201-AN5 Operations on Rational Expressions
201-AN6 Rational Equations

Absolute Value & Reciprocal Functions
201-AN1 Absolute Value
201-RF2 Absolute Value Functions
201-RF11 Reciprocal Functions

Sequences & Series
201-RF9 Arithmetic Sequences and Series
201-RF10 Geometric Sequences and Series

Evaluation

Final grades will be calculated as follows:

Radicals & Factoring	10%
Quadratics	12%
Systems and Inequalities	9%
Trigonometry	12%
Rationals	12%
Absolute Value & Reciprocal Functions	9%
Sequences and Series	6%
Final Exam	30%

Note – All coursework must be complete in order to receive credit for this course. <u>Significant</u> 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.

Learning Outcomes

Math 20-1 is comprised of the following learner outcomes as outlined in the *Mathematics Program of Studies* set forth by *Alberta Learning*.

Strand: Algebra and Number
General Outcome: Develop algebraic reasoning and number sense.

201-AN1 **Absolute Value –** Demonstrate an understanding of the absolute value of real numbers.

201-AN2 **Radicals –** Solve problems that involve operations on radicals and radical expressions with numerical and variable radicands.

201-AN3 **Radical Equations –** Solve problems that involve radical equations (limited to square roots.)

201-AN4 **Equivalent Forms of Rational Expressions -** Determine equivalent forms of rational expressions (limited to numerators and denominators that are monomials, binomials, or trinomials).

201-AN5 **Operations on Rational Expressions –** Perform operations on rational expressions (limited to numerators and denominators that are monomials, binomials, or trinomials).

201-AN6 **Rational Equations –** Solve Problems that involve rational equations (limited to numerators and denominators that are monomials, binomials, or trinomials).

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Strand: Trigonometry
General Outcome: Develop trigonometric reasoning.

20-1-T1 Angles - Demonstrate an understanding of angles in standard position
$[0° – 360°]$.

20-1-T2 Sine, Cosine, and Tangent – Solve problems, using the three primary trigonometric
ratios for angles from 0° to 360° in standard position.

20-1-T3 Sine and Cosine Law – Solve problems, using the cosine law and sine law, including the
ambiguous case.

Strand: Relations and Functions
General Outcome: Develop algebraic and graphical reasoning through the
study of relations.

201-RF1   **Factoring** – Factor polynomial expressions of the form:
- $ax^2 + bx + c, a \neq 0$
- $a^2x^2 - b^2x^2, a \neq 0, b \neq 0$
- $a(f(x))^2 + b(f(x)) + c, a \neq 0$
- $a^2(f(x))^2 - b^2(g(y))^2, a \neq 0, b \neq 0$

Where *a, b,* and *c* are rational numbers.

201-RF2   **Absolute Value Functions** – Graph and analyze absolute value functions (limited to
linear and quadratic functions) to solve problems.

201-RF3   **Quadratic Functions in Standard Form** $(y = a(x - p)^2 + q)$ – Analyze quadratic
functions of the form $y = a(x - p)^2 + q$ and determine the: vertex, domain and
range, direction of opening, axis of symmetry, *x*- and *y*-intercepts.

201-RF4   **Quadratic Functions in General Form** $(y = ax^2 + bx + c)$ – Analyze quadratic
functions of the form $y = ax^2 + bx + c$ to identify characteristics of the
corresponding graph including: vertex, domain and range, direction of opening, axis
of symmetry, *x*- and *y*-intercepts, and to solve problems.

201-RF5   **Quadratic Equations** – Solve problems that involve quadratic equations.

201-RF6   **Systems of Equations** – Solve, algebraically and graphically, problems that involve
systems of linear-quadratic and quadratic-quadratic equations in two variables.

201-RF7   **Inequalities –** Solve problems that involve linear and quadratic inequalities in two variables.

201-RF8   **Quadratic Inequalities –** Solve problems that involve quadratic inequalities in one variable.

201-RF9   **Arithmetic Sequences and Series –** Analyze arithmetic sequences and series to solve problems.

201-RF10   **Geometric Sequences and Series –** Analyze geometric sequences and series to solve problems.

201-RF11   **Reciprocal Functions –** Graph and analyze reciprocal functions (limited to the reciprocal of linear and quadratic functions).