PEACE RIVER SCHOOL DIVISION

VIRTUAL EDUCATION PROGRAM

"Learning Together - Success for All"

Math 30-1

Course Outline

2021-22 Semester 1

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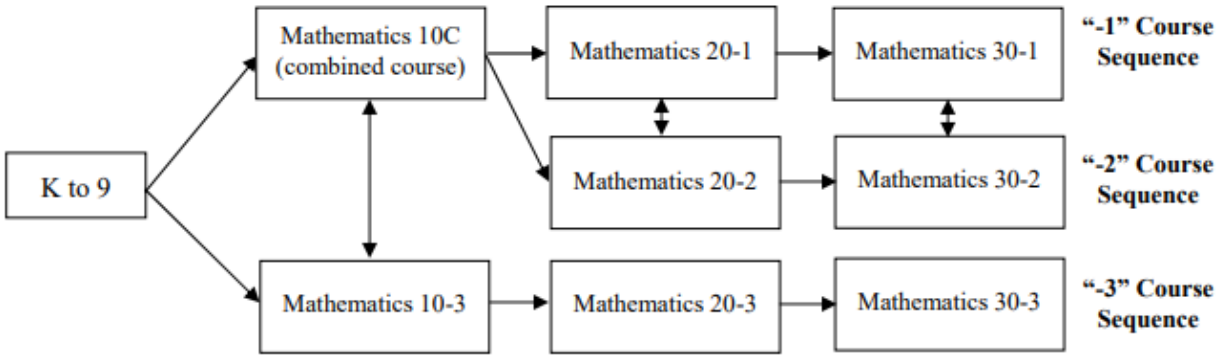
I. Course Overview



(As per Alberta Program of Studies) Math 30-1 is a 5 credit course with a successful completion of Math 20-1 as the prerequisite. Math 30-1 is the required math course for post-secondary programs that include Calculus and other mathematics applications. See individual institutions for exact prerequisites.

Upon completion of this course, students are expected to:

- ☐ Use communication in order to learn and express their understanding.
- ☐ Demonstrate fluency with mental mathematics and estimation.
- ☐ Develop and apply new mathematical knowledge through problem solving.
- ☐ Develop mathematical reasoning.
- ☐ Select and use technology as a tool for learning and solving problems.
- ☐ Develop visualization skills to assist in processing information, making connections, and solving problems
- ☐ Explore and create patterns, examine relationships, test conjectures and solve problems.
- ☐ Realize that it is acceptable to solve problems in different ways, using a variety of strategies.
- ☐ Develop both conceptual and procedural understandings of mathematics and apply them to real-life problems.

- ☐ Develop critical thinking skills identified for entry into post-secondary programs that require the study of calculus.

II. Key Messages/Expectations

- ☐ **Attendance** is one of the most important factors for academic success. It is expected that you come to class every day through the Google Meet link on time with the materials you require for class. **All notes, handouts and assignments missed due to absence are your responsibility.** Please make arrangements with your teacher or with a classmate to obtain missed materials.
- ☐ If you miss a test due to an excused absence, you may write the test in class on your first day back. A note from your parents and/or guardians excusing the absence will be required.
- ☐ **All exercises and assignments** are due at the **beginning of class**; **on or before the due date**. Due dates will be posted with the assignments in Google Classroom.
- ☐ It is expected that you will stay on task during the class time. Mature and considerate behaviour is expected in class.
- ☐ **Listen attentively** to instruction and be sure to **ask questions** to clarify concepts. Chances are you are not the only one who doesn't understand. Listen when others ask questions; listen to both the question and the answer. It may be that the student asking the question thought of something that you didn't think of.
- ☐ **Music & iPods:** *Okay sometimes….*
- ☐ During independent seat work, you are welcome to listen to music.
- ☐ You may NOT listen to music during instructional time or during any quiz, test, or exam.
- ☐ This is a **privilege** and can be easily removed.
    - ☐ A daily demonstration of a willingness to participate in class activities and exercises, attending regularly, and showing a consistent, conscientious effort towards the course material will increase your chance of success in this course! ***You are here to do the best you can!***
    - ☐ **Practice, Practice, Practice!** Practice as much as possible

Virtual Education is an exciting opportunity for PRSD students. Regular attendance and productive engagement in course material is an expectation and requirement for success in this course, both during synchronous and asynchronous instruction and learning activities.

Course content is organized into both teacher-directed and student-directed learning activities. Successful students will employ effective time management strategies to complete all activities on time.

Students are expected to demonstrate appropriate online and in-person behaviour in accordance with PRSD Board Policies and Administrative Procedures. By default, teachers will require students to have their cameras on during class time and require students to respond to

questions or participate in discussions with their microphone. There will be times when teachers may allow students to turn their cameras off.

III. Scope and Sequence

Relations and functions:

- ☐ Demonstrate an understanding of operations on, and compositions of, functions
- ☐ Demonstrate an understanding of the effects of horizontal and vertical translations on the graphs of functions and their related equations.
- ☐ Demonstrate an understanding of the effects of horizontal and vertical stretches on the graphs of functions and their related equations.
- ☐ Apply translations and stretches to the graphs and equations 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
- ☐ Demonstrate an understanding of inverses of relations.
- ☐ Demonstrate an understanding of logarithms.
- ☐ Demonstrate an understanding of the product, quotient, and power laws of logarithms.
- ☐ Graph and analyze exponential and logarithmic functions.
- ☐ Solve problems that involve exponential and logarithmic equations
- ☐ Demonstrate an understanding of factoring polynomials of degree greater than 2 (limited to polynomials of degree ≤ 5 with integral coefficients).
- ☐ Graph and analyze polynomial functions (limited to polynomials of degree ≤ 5 with integral coefficients).
- ☐ Graph and analyze radical functions (limited to functions involving one radical).
- ☐ Graph and analyze rational functions (limited to numerators and denominators that are monomials, binomials, or trinomials).

Trigonometry:

- ☐ Demonstrate an understanding of angles in standard position, expressed in degrees and radians.
- ☐ Develop and apply the equation of the unit circle.
- ☐ Solve problems, using the six trigonometric ratios for angles expressed in radians and degrees.
- ☐ Graph and analyze the trigonometric functions Sine, Cosine, and Tangent to solve problems
- ☐ Solve, algebraically and graphically, the first and second-degree trigonometric equations with domain expressed in degrees and radians.

☐ Prove trigonometric identities, using:

- Reciprocal identities
- Quotient identities
- Pythagorean identities
- Sum or difference identities (restricted to Sine, Cosine, and Tangent)
- Double-angle identities (restricted to Sine, Cosine, and Tangent.)

Permutations, Combinations, and Binomial Theorem:

☐ Apply the fundamental counting principle to solve problems.

☐ Determine the number of permutations of n elements taken r at a time to solve problems. **($_nP_r$)**

☐ Determine the number of combinations of n different elements taken r at a time to solve problems **($_nC_r$)**

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

« Alberta Program of Studies will be followed for each topic throughout the course.

Course Schedule **Dates subject to change**

Unit	**Chapter(s) From workbook**	**Timeline**
1.Transformations & Functions	1.Functions and relations	Sep 1 – Sep 24
	2.Transformations	
2. Expo. & Log. functions	3. Expo. & Log. functions	Sep 25 – Oct 21
	4. Applications of Expo. & Log. functions	
3.Functions & Equations	5.Polynomial Functions & Equations	Oct 22 – Nov 20
	7.Analyzing Radical & Rational functions	
4. Trigonometry	8. Trigonometric functions & Graphs	Nov 24 – Dec 18

	9. Trigonometric Equations & Identities	
5. Permutations, Combinations & Binomial theorem	6. Permutations & Combinations	Jan 4 – Jan 12

Course Review: Diploma Examination Preparation

IV. Instruction and Assessment

Teaching Methodology

Students will begin class each day with introduction work that could include review of prior lessons or knowledge. The purpose of this portion is to help keep the student academically engaged from bell to bell. Students are expected to log in to the Google Meet, each day to check in with the teacher and know the expectations for that class time. There may be alternate days of instruction and/or work time.

Students will be taught through a variety of different instructional methods including: direct teaching, cooperative learning, independent learning, as well as small and large group discovery-based activities which will be done through the use of breakout rooms in our online platform.

Technological means including the use of annotated documents (Kami), web-based video examples, online tools, and interactive response systems may be used when and where appropriate.

There will be formative and summative assessments throughout the course. Formative assessments may appear on Power School and are required prior to summative assessment opportunities. I.e. do the day-to-day classwork in order to demonstrate your understanding of the concepts prior to engaging in summative assessments. Worked solutions for all practice questions will be posted within 48 hours of the lesson to allow for students to check their understanding.

Outcome based tests/Quizzes and Assignments: Each Unit consists of various learning outcomes. Achievement indicators will be used to determine whether students have met the corresponding specific outcomes. Quizzes are always completed in class. Assignments will be given in class and may be completed for homework. You are expected to show the complete work/process for each problem of your assignment in order to receive full marks. .

Unit Exams: These will occur at the completion of each unit. And will be supervised assessments at the school site.

Extra Help: Be sure to ask questions to clarify concepts. Please do not hesitate to make an appointment with your teacher to obtain any extra help you may need throughout the course.

Students are encouraged to utilize the **Success Block** efficiently and effectively for completing the Math assignments/to learn the missed concepts/completing the test.

Power School:A variety of instructional and formative and summative assessment strategies will be used throughout this course, including through the use of both technology and traditional pencil-and-paper. Summative assessments will be used to determine course grades which can be accessed through PowerSchool.

The course will be evaluated over the term as follows:

Evaluation (per unit)		Course Evaluation	
		Transformations & Functions	15%
Objective based Performance /Quizzes.	25%	Exponential & Logarithmic Functions	19%
Assignments	25%	Functions & Equations	19%
Unit Tests	50%	Trigonometry	30%
		Permutations and Combinations	17%
		Total	100%

Evaluation consists of two major components: term work, worth 70% of the final grade and the diploma exam, worth 30% of the final grade. The term work consists of the weighted average of the five units (as listed above.)

V. Resources

Course Materials

- Textbook- Pre-Calculus 12(McGraw-Hill Ryerson)
- **Pre-Calculus 12 Mathematics workbook (Absolute Value Publications)**
- Graphing calculator; every student is asked to buy a **Texas Instrument TI-83+ or 84 Graphing Calculator**. This is the calculator that will be used for demonstrations and exercises in this course.
- Binder with lined paper
- Straight edge
- 0.5 cm. graph paper
- Pencils and erasers

Students require access to reliable high speed internet that supports Google Meets. Students require a compatible device, usually a Chromebook, with a working webcam to access and participate in the course. Students require a working headset that includes a microphone and headphones.

References:

Mathematics Program of Studies 10-12
Math Parent Resources
https://questaplus.alberta.ca/