ADLC

Mathematics 30-1

Introduction

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Mathematics 30-1
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Introduction

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Alberta Distance Learning Centre website:

http://www.adlc.ca

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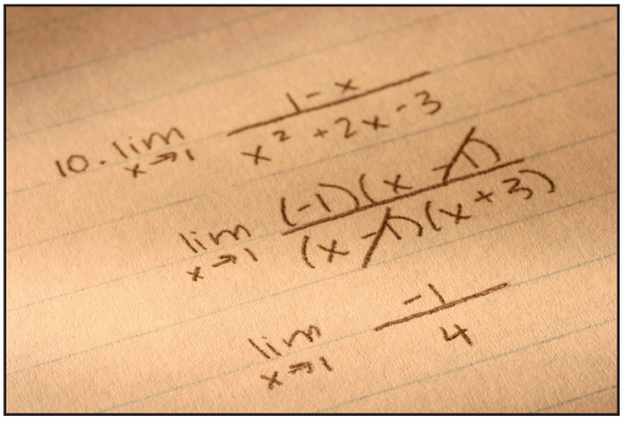
ADLC Alberta Distance Learning Centre

Table of Contents

Welcome to Mathematics 30-1

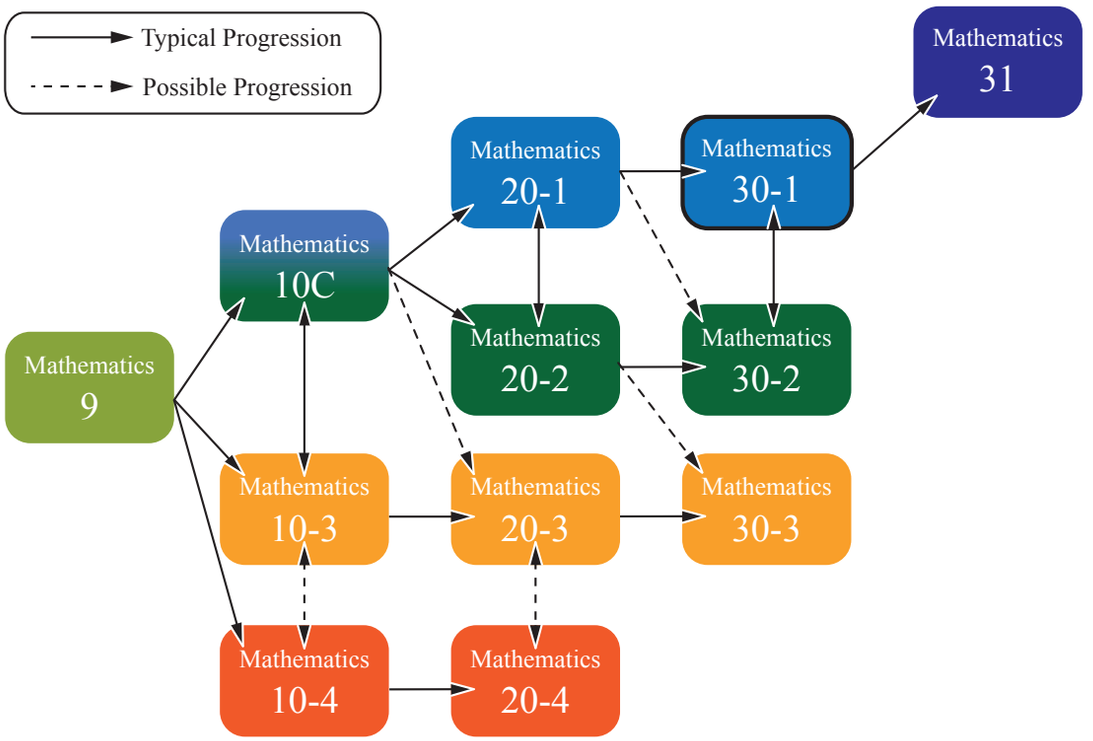
Welcome to *Math 30-1*! This course covers a variety of topics and is designed to give students a strong foundation for learning calculus. **Please read this document carefully, and contact your teacher if you have any questions.**



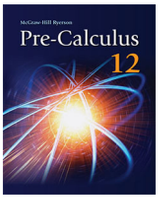
This course is primarily designed for students who plan to attend a post-secondary program requiring calculus. Such programs include math, engineering, science, and advanced finance. Many university programs will also accept *Math 30-2*, and some even prefer it. If you are unsure whether *Math 30-1* is the appropriate course for you, contact the post-secondary school you plan to attend.

Students taking *Math 30-1* are usually required to have completed *Math 20-1*, *Math 30-2*, or an equivalent course, without encountering serious difficulty. If you are unsure whether your math background is appropriate for this course, please contact your teacher.

Progression Through Course Sequence



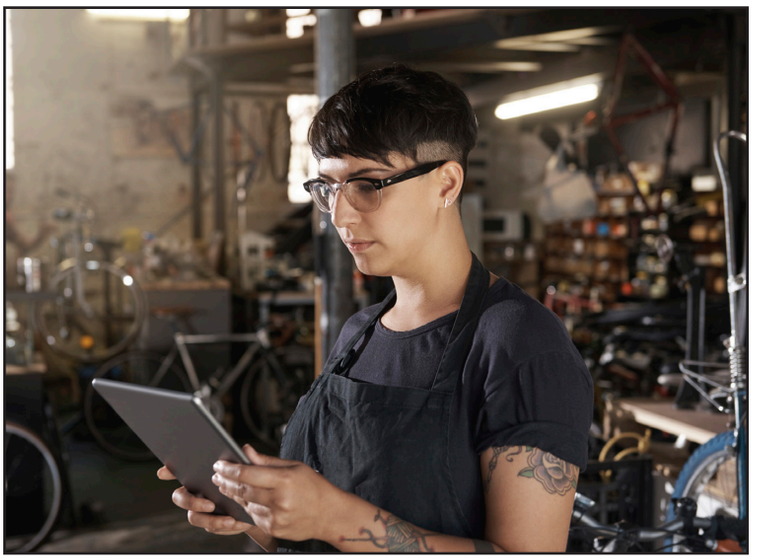
Mathematics 30-1 Approved Resources



To complete this course, you will need the *Pre-Calculus 12* textbook and a graphing calculator. The *Texas Instruments TI-83/TI-84* series of calculators are popular; however, other calculators are acceptable. A list of approved calculators can be found on the Alberta Education website. If you are unsure, contact your teacher.

Additional Resources

Working independently can be challenging, but knowing where to find more information about course topics will help you with some of the more difficult sections. Make sure to see the *Additional Resources* page in *Moodle*. There, you will find related videos, interactive activities, and some recommended websites. Contact your teacher if you are unable to access the *Additional Resources* page.



Mathematics 30-1 Course Content

This *Math 30-1* course is divided into seven *Units*. Each *Unit* is further subdivided into *Lessons*.

1. Functions (4 *Lessons*)
2. Trigonometry (4 *Lessons*)
3. Transformations (2 *Lessons*)
4. Logarithms (2 *Lessons*)
5. Function Operations (1 *Lesson*)
6. Permutations, Combinations, and the Binomial Theorem (2 *Lessons*)
7. Review (3 *Lessons*)

Each *Lesson* contains instructional information in the *Module* and activities for you to complete in the *Workbook(s)*.

Parts of the Module

Warm Up

- These activities review previously learned skills. If you have trouble here, make sure to do some review or contact your teacher.

Investigation

- These activities introduce new ideas and can be thought of as puzzles. If you are able to complete these, you probably already have a basic understanding of some of the content in the *Lesson*.

Explore the Lesson

- These sections include information and examples that will help you master the big ideas of the lesson. Make sure to read the accompanying textbook sections as well.

Parts of the Workbook

Practice

- There are multiple *Practice* sessions in each Lesson. The *Practice* questions come from the *Pre-Calculus 12* textbook. Once you complete these questions, **you are required to assign yourself a grade using the *Practice Assessment Rubric***. These grades will be combined with your ***Explore Your Understanding Assignment*** grades.

Explore Your Understanding Assignment

- These assignments are found at the end of each workbook. They cover concepts from the entire lesson. Your marker will grade these assignments.

Quizzes and Exams

Test Your Understanding Quiz

- At the end of each Lesson, you will complete an unsupervised *Test Your Understanding Quiz*. You will write these in *Moodle*. You can use any and all course materials to help you complete these quizzes. The quizzes are computer-graded, and each one can be completed twice. The average grade of the quizzes will be used if the quiz is completed twice. If you do not have internet access, please contact your teacher to make alternate arrangements to write the quizzes.

Midterm Exam

- The midterm exam is based on *Units 1* and *2*. It includes multiple choice, numerical response, and written response questions. You will have three hours to complete the exam.
- **You will not be allowed to write the midterm exam until all assignments and quizzes from *Units 1* and *2* are complete and marked.**
- When you are ready to write your midterm exam, please contact your exam supervisor or an ADLC campus to make arrangements.

Final Exam

- The final exam includes material from the entire course, but with greater focus on *Units 3-6*. It includes multiple choice, numerical response, and written response questions. You will have three hours to complete the exam.
- **You will not be allowed to write the final exam until all assignments and quizzes are complete and marked.**
- When you are ready to write your final exam, please contact your exam supervisor or our ADLC campus to make arrangements.

Diploma Exam

- *Math 30-1* is divided into two sections: the course and the diploma exam. The diploma exam is separate from this course, but you will need to complete it to receive credit for *Math 30-1*. Please see the *Provincial Diploma Examination Procedures for Distance Learning Students* document for more information on diploma exams. Note that diploma exams are only available to be written on a few dates each year.

Mark Breakdown

Category	Weighting
Getting Started in Math 30-1 Quiz	Complete/Incomplete
Workbooks	17% (weighted 20% for *Practice* and 80% for *Explore Your Understanding Assignments*)
Quizzes	33%
Midterm	20%
Final Exam	30%

To determine an overall Math 30-1 mark, the course mark is combined with the diploma exam mark, where the course mark is weighted at 70% and the diploma exam is weighted at 30%.

Completing the Course

Workbook Submission Methods

- **Postal Mail** – Mail the completed *Workbook* to an Alberta Distance Learning Centre campus. Ensure you attach sufficient postage by having the envelope weighed at the post office.

- **Electronically** – Scan the completed print-form *Workbook*. Save the file to your computer as ***Math30-1Wrbk#FirstInitialLastName***. Then, upload the file into the appropriate *Moodle* assignment page.

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- **In Person** – Drop the completed *Workbook* at our Alberta Distance Learning Centre campus.

- **Fax** – Fax the completed *Workbook* to our Alberta Distance Learning Centre campus.

Course Timeline

There are no set due dates in this course, but setting up a schedule for yourself is a good way to stay on track. First, decide which diploma exam date you wish to work towards. Next, pick a date a few weeks before the exam, and plan to finish the entire course by then. Finally, make a schedule showing when you hope to complete each lesson.

If you would like assistance setting up a course timeline, please contact your teacher.

ADLC Plagiarism Policy (ADLC Administrative Policy 60–1)

Program integrity and academic honesty are very important at ADLC. When students are successful in ADLC courses, we want full confidence that they have clearly met the intended program outcomes.

Plagiarism is the practice of representing someone else's work or ideas as one's own. It is an academically dishonest practice and is detrimental to a student's knowledge & skill development.

ADLC takes a progressive approach to plagiarism to educate and correct the behaviour. If a student is currently enrolled in any ADLC course and found to have plagiarized work, the following steps are taken:

Warning: ADLC Teachers decide if a warning happens instead of calling the first instance. The warning is recorded in SIS Communications.

First Instance	Second Instance	Third Instance
Students are assigned a mark of zero and a chance to redo the question or the assignment. It is up to the ADLC teacher's discretion whether or not to assign a mark of zero on the plagiarized question or on the entire assignment. ADLC teachers record a SIS Communication and a 'Student Note'.	The student is assigned a mark of zero with no chance to redo the question or the assignment. It is up to the ADLC teacher's discretion whether or not to assign a mark of zero on the plagiarized question or on the entire assignment. The ADLC Principal, or designate, is notified and the instance is recorded in SIS Communications.	Student is removed from the course in which the third instance occurred. The ADLC Principal, or designate, is notified and the instance is recorded in SIS Communications.

Important

While removal from a course is limited to the course in which the Third Instance has occurred, the preceding steps can occur across different courses. A student who has been found plagiarizing in Course A and held to the First Instance consequences who then plagiarizes in Course B will move to the Second Instance consequences.

Further Instances

After the Third Instance, any further instances of plagiarism in any course will result in immediate removal from that course. Ongoing occurrences may result in removal from all courses and barring of registration with ADLC.

Clean Slate

Students earn a clean slate after one calendar year passes with no instances.

Sharing of ADLC Work (ADLC Administrative Policy 60–4)

Plagiarism is the practice of representing someone else's work or ideas as one's own. It is a dishonest practice and is damaging to a student's knowledge & skill development. Plagiarism is addressed in ADLC Administrative Policy 60-01.

The sharing of school work, especially after having been marked by ADLC, to students for the purposes of submitting plagiarized work (either paraphrasing or directly copying student work) is dishonest, and this sharing goes against the Alberta School Act's expectation of students to respect school rules and co-operate with how schools offer education to their students.

ADLC prefers to take a progressive approach to sharing of work with other students, in order to educate and correct the behaviour.

If a student is currently enrolled in any ADLC course and found to be sharing school work, whether from their current course or another, to others:

First Incidence	Second Incidence
The student is informed that their work has been submitted as plagiarized work by another student; a warning is provided that further submissions of such work, from any course, will be grounds for removal from the current course(s).	The student is removed from all active ADLC courses.

If the student is not currently enrolled in any ADLC course and found to be sharing school work with others, they are informed that their work has been submitted as plagiarized work by another student and, as such, further registrations in any ADLC course will not be permitted. The incident will be recorded on the student's file.

Such actions do not limit ADLC to pursue other remedies (actions), either criminal or civil, for the distribution of its copyrighted materials.

Our Pledge to Students

Alberta Distance Learning Centre is committed to helping students achieve their educational goals. We look forward to assisting students who are sincere in their desire to learn. Students may contact their course teacher(s) by phone, e-mail, fax, postal mail, or in person at an Alberta Distance Learning Centre campus.

Contact your teacher regularly to discuss your progress and to ask any questions you have about this course. Math teachers are available every weekday and are ready to work with you. Their regular office hours are Monday to Friday, 8:30 a.m. to 4:00 p.m.

Please log into *Moodle* and complete the *Getting Started in Math 30-1 Quiz*. Contact your teacher if you have difficulty finding or completing this activity.

Mathematics 30-1 Formula Sheet

For $ax^2 + bx + c = 0$,

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Relations and Functions

Graphing Calculator Window Format

$$x: [x_{\min}, x_{\max}, x_{\text{scl}}]$$
$$y: [y_{\min}, y_{\max}, y_{\text{scl}}]$$

Laws of Logarithms

$$\log_b(M \times N) = \log_b M + \log_b N$$
$$\log_b\left(\frac{M}{N}\right) = \log_b M - \log_b N$$
$$\log_b(M^n) = n \log_b M$$
$$\log_b c = \frac{\log_a c}{\log_a b}$$

Growth/Decay Formula

$$y = ab^{\frac{t}{p}}$$

General Form of a Transformed Function

$$y = af[b(x - h)] + k$$

Permutations, Combinations, and the Binomial Theorem

$n! = n(n-1)(n-2)\ldots 3 \times 2 \times 1$,
where $n \in \mathrm{N}$ and $0! = 1$

$$_nP_r = \frac{n!}{(n-r)!}$$
$$_nC_r = \frac{n!}{(n-r)!r!} \quad _nC_r = \binom{n}{r}$$

In the expansion of $(x + y)^n$,
the general term is $t_{k+1} = {}_nC_k x^{n-k} y^k$.

Trigonometry

$$\theta = \frac{a}{r}$$
$$\tan\theta = \frac{\sin\theta}{\cos\theta} \quad \cot\theta = \frac{\cos\theta}{\sin\theta}$$
$$\csc\theta = \frac{1}{\sin\theta} \quad \sec\theta = \frac{1}{\cos\theta}$$
$$\cot\theta = \frac{1}{\tan\theta}$$

$$\sin^2\theta + \cos^2\theta = 1$$
$$1 + \tan^2\theta = \sec^2\theta$$
$$1 + \cot^2\theta = \csc^2\theta$$

$$\sin(\alpha + \beta) = \sin\alpha\cos\beta + \cos\alpha\sin\beta$$
$$\sin(\alpha - \beta) = \sin\alpha\cos\beta - \cos\alpha\sin\beta$$
$$\cos(\alpha + \beta) = \cos\alpha\cos\beta - \sin\alpha\sin\beta$$
$$\cos(\alpha - \beta) = \cos\alpha\cos\beta + \sin\alpha\sin\beta$$

$$\tan(\alpha + \beta) = \frac{\tan\alpha + \tan\beta}{1 - \tan\alpha\tan\beta}$$
$$\tan(\alpha - \beta) = \frac{\tan\alpha - \tan\beta}{1 + \tan\alpha\tan\beta}$$
$$\sin(2\alpha) = 2\sin\alpha\cos\alpha$$
$$\cos(2\alpha) = \cos^2\alpha - \sin^2\alpha$$
$$\cos(2\alpha) = 2\cos^2\alpha - 1$$
$$\cos(2\alpha) = 1 - 2\sin^2\alpha$$
$$\tan(2\alpha) = \frac{2\tan\alpha}{1 - \tan^2\alpha}$$

$$y = a\sin[b(x - c)] + d$$
$$y = a\cos[b(x - c)] + d$$

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