

MATH 30-1A, Mathematics 30-1*5 credits, 6 hours lecture*

Topics covered include the unit circle; graph, analyze and solve problems using the three primary trigonometric functions for angles expressed in radians and degrees; solve first degree trigonometric equations; prove trigonometric identities; perform operations on and composition of functions; analyze and perform translations on graphs of functions and related equations; logarithms; graph, analyze and solve polynomial functions; permutations, combinations and binomial theorem.

*Alberta Education Equivalency: Math 30-1**Prerequisite: Math 20-1 or Math 30-2 or permission of the Program Chair***Instructor**

Leni Cherian
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Office Hours

Wednesday	12:00 to 1:50 pm
Thursday	11:00 to 12:50 pm
Friday	12:00 to 12:50 pm

Hours of Instruction

Monday	10:00 to 11:50 am
Tuesday	10:00 to 11:50 am
Friday	10:00 to 11:50 am

Required Resources

Precalculus12, McGraw- Hill Ryerson, ISBN: 978-007-073-8720

TI-83 Plus Calculator

Ruler

Graph Paper

Course Outcomes

Upon successful completion of Math 30-1, students will be able to:

Function Transformations

- Determine the effects of h and k in $y - k = f(x - h)$ on the graph of $y = f(x)$
- Sketch the graph of $y - k = f(x - h)$ for given values of h and k , given the graph of $y = f(x)$
- Write the equation of a function whose graph is a vertical and/or horizontal translation of the graph of $y = f(x)$
- Develop an understanding of the effects of vertical and horizontal stretches on the graphs of functions and their related equations
- Develop an understanding of the effects of reflections on the graphs of functions and their related equations, including reflections through x axis, y axis and the line $y = x$
- Sketch the graph of a transformed function by applying translations, reflections and stretches
- Write the equation of a function that has been transformed from the function $y = f(x)$
- Sketch the graph of the inverse of a relation
- Determine if a relation and its inverse are functions
- Determine the equation of an inverse

Exponential Functions

- Analyze graphs of exponential functions
- Solve problems that involve exponential growth or decay.
- Apply translations, stretches and reflections to the graphs of exponential functions
- Represent these transformations in the equations of exponential functions
- Solving exponential equations

Logarithmic Solve Functions

- Demonstrate that a logarithmic function is the inverse of an exponential function
- Sketch and determine the characteristics of the graph $y = \log_c x$, $c > 0$, $C \neq 1$
- Express a logarithmic function as an exponential function and vice versa
- Evaluate logarithm using a variety of methods
- Explain the effects of the parameters a , b , h and k in $y = a \log_c(b(x - h)) + k$ on the graph of $Y = \log_c X$
- Sketch the graph of a logarithmic function by applying a set of transformations to the graph of $y = \log_c X$
- Demonstrate an understanding of the product, quotient and power laws of logarithms.
- Determine the equivalent form of a logarithmic expression using the laws of logarithms
- Solve problems that involve logarithmic equations.

Trigonometry

- Demonstrate an understanding of angles in standard position, expressed in degrees and radians.
- Solve problems involving arc lengths, central angles and the radius in a circle.
- Develop and apply the equation of the unit circle
- Solve problems using the six trigonometric ratios for angles expressed in radians and degrees.
- Solve algebraically and graphically, first and second degree trigonometric equations with the domain expressed in radians and degrees
- Graph and analyze the trigonometric functions sine, cosine and tangent to solve problems.
- Prove trigonometric identities using reciprocal, quotient, Pythagorean identities, sum or difference identities and double angle identities

Relations and Functions

- Demonstrate an understanding of operations on, and compositions of, functions
- Demonstrate an understanding of factoring polynomial of degree greater than 2 (limited to polynomials of degree ≤ 5 with integral coefficients).
- Graph and analyze polynomial functions (limited to polynomial functions of degree ≤ 5)
- 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)

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
- Determine the number of combinations of 'n' different elements taken 'r' at a time to solve problems.
- Expand powers of a binomial using binomial theorem and Pascal triangle

Evaluation

Unit Assignments	10%
Quiz	15%
Mid Term 1	20%
Mid Term 2	20%
Final Exam	35%
Total	100%

The minimum pre-requisite for progression is 1.7 (refer to grading system below)

Grading System

Descriptor	4.0 Scale	Percent
	4.0	96 – 100
Excellent	4.0	90 – 95
	3.7	85 – 89
Good	3.3	81 – 84
	3.0	77 – 80
	2.7	73 – 76
Satisfactory	2.3	69 – 72
	2.0	65 – 68
Minimum Prerequisite	1.7	60 – 64
Poor	1.3	55 – 59
Minimum Pass	1.0	50 – 54
Failure	0.0	0 – 49

Topic Outline

Transformations	Chapter 1- Sections 1.1, 1.2, 1.3, 1.4
Exponents/Logarithms	Chapter 7 -Sections 7.1,7.2,7.3
Fundamental Counting Principle	Chapter 11-Sections 11.1, 11.2, 11.3
Relations and Functions	Chapter 3-Sections 3.1, 3.2, 3.3, 3.4 Chapter 2-Section 2.3
Trigonometric Functions & Equations	Chapter 4-Sections 4.1, 4.2, 4.3, 4.4 Chapter 5-Sections 5.1, 5.2, 5.4

Performance Requirements

Student Responsibilities

It is your responsibility as a student to contact the Office of the Registrar to complete the forms for Withdrawal or Change of Registration, and any other forms. Please refer to the list of important dates as noted in the Academic Schedule in the [Keyano College credit calendar](#). The Keyano College credit calendar also has information about Student Rights and Code of Conduct. It is the responsibility of each student to be aware of the guidelines outlined in the Student Rights and Code of Conduct Policies.

Student Attendance

Class attendance is useful for two reasons. First, class attendance maximizes a student's learning experience. Second, attending class is a good way to keep informed of matters relating to the administration of the course (e.g., the timing of assignments and exams). Ultimately, you are responsible for your own learning and performance in this course.

It is the responsibility of each student to be prepared for all classes. Students who miss classes are responsible for the material covered in those classes and for ensuring that they are prepared for the next class, including the completion of any assignments and notes that may be due.

Academic Misconduct

Students are considered to be responsible adults and should adhere to principles of intellectual integrity. Intellectual dishonesty may take many forms, such as:

- Plagiarism or the submission of another person's work as one's own;
- The use of unauthorized aids in assignments or examinations (cheating);
- Collusion or the unauthorized collaboration with others in preparing work;
- The deliberate misrepresentation of qualifications;
- The willful distortion of results or data;
- Substitution in an examination by another person;
- Handing in the same unchanged work as submitted for another assignment; and
- Breach of confidentiality.

The consequences for academic misconduct range from a verbal reprimand to expulsion from the College. More specific descriptions and details are found in the Student Rights and Code of Conduct section of the Keyano College credit calendar. It is the responsibility of each student to be aware of the guidelines outlined in the Student Rights and Code of Conduct Policies.

In order to ensure your understanding of the concept of plagiarism, you must successfully complete the online tutorial found on ilearn.keyano.ca. Then print the certificate, sign it, and show it to each of your instructors. Your course work may not be graded until you show this signed certificate.

Specialized Supports

The Student Services department is committed to Keyano students and their academic success. There are a variety of student supports available at Keyano College. Due to the continuing situation with the Covid-19 pandemic, the offered support services will be implemented differently this semester by being provided mostly virtually. In-person service can be requested as needed. All Alberta Health Services guidelines will be followed for in-person appointments—wear a mask, maintain two meters of physical distance, use hand sanitizer, and stay home if you are unwell.

All student services are available during Keyano business hours: Monday to Friday, 8h30-16h30.

Accessibility Services: provides accommodations for students with disabilities. Students with documented disabilities, or who suspect a disability, can meet with a Learning Strategist to discuss

their current learning barriers and possible accommodations. Students who have accessed accommodations in the past are encouraged to contact us to request them for the semester. Please note that requesting accommodations is a process and requires time to arrange. Contact us as soon as you know you may require accommodations. For accessibility services supports and to book a virtual appointment, please contact accessibility.services@keyano.ca.

Accessibility Services also provides individual and group learning strategy instruction for all students, as well as technology training and supports to enhance learning. Meet with a Learning Strategist to learn studying and test-taking strategies for online classes. Schedule an appointment with the Assistive Technology Specialist to explore technology tools for learning. Book an appointment today by emailing accessibility.services@keyano.ca

Wellness Services: offers a caring, inclusive, and respectful environment where students can access free group and individual support to meet academic and life challenges. Mental Health Coordinators offer a safe and confidential environment to seek help with personal concerns. All individual appointments will continue virtually.

Wellness Services welcomes students to participate in any of the virtual group sessions offered throughout the academic year addressing topics including mindfulness and test anxiety.

Individual virtual appointments can be made by emailing wellness.services@keyano.ca.

Library Services: provides students with research and information supports as they engage in their studies. Library staff are available to support you both virtually and in person throughout the semester. For a detailed list of library supports and services, go to www.keyano.ca/library. For any inquiries, please email askthelibrary@keyano.ca.

Begin your research with the Library's FIND page. Search for sources using OneSearch, the Library's Catalogue, or by searching in a specific database selected from the A-Z Database List.

Individual support with the Information Librarian is available virtually. Appointments can be requested by using the Book A Librarian online form.

Research and Subject Guides are helpful resources when beginning your research or addressing other information needs. To view a subject or course specific guide, go to the Subject Guide webpage [here](#).

To access additional research resources, including Citation Guides (APA, MLA, Chicago, or IEEE), go to the [Research Help Library page](#).

The Loanable Technology collection is available to support students in their online learning pursuits. Items available for borrowing include mobile projectors, webcams, noise cancelling headphones, Chromebooks, and laptops. For an up-to-date list of technology available for borrowing, go to the Library's [Loanable Technology webpage](#).

Skill Centre: Provides academic support services to students registered in credit programs at Keyano College in the form of tutoring, assignment/lab support, writing support groups, facilitated study groups, workshops, and study space. This service is free and is available for all Math, Sciences, Humanities and Trades courses offered at Keyano.

While most courses are being offered online, the Skill Centre will be offering mostly virtual services and in-person sessions as requested. Please email Skill@keyano.ca to get in contact with our Academic Content Specialists. The Skill Centre is located in CC-119 at the Clearwater Campus.

For the most up to date information on how to book a session, please view the [Keyano Skill Centre homepage](#).

Academic Success Coaching: offers you support and access to resources for your academic success to help you to find the Keys to your Success. The Academic Success Coach will work with you to develop an academic success plan, develop your study and time management skills, and connect you with the right resources here at Keyano. Academic.success@keyano.ca is the best way to access resources during virtual service delivery. The Academic Success Coach is located in the Skill Centre in CC-119 at the Clearwater Campus.

E-Learning

Technology and internet will impact your online learning experience. It's important that you are able to watch an online video and other course materials, take online quizzes, and participant in a live class with your instructor and other students.

Keyano College operates in a Windows based environment and having the correct tools for online learning is important. Here's a list of recommended system requirements.

Internet Speed

Minimum Internet speeds of 5 Mbps.

Recommended Internet speeds of 25 Mbps (especially if you are sharing your internet at home).

Check your internet speed with Fast.com.

System requirements:

Microsoft Windows	Apple
<p>Minimum Requirements:</p> <ul style="list-style-type: none"> • A Windows 10 computer/laptop • Minimum 4GB of RAM. • 10GB+ available hard drive storage. • Enough available hard drive space to install the Microsoft Office suite (approximately 3GB). <u>Microsoft Office</u> software is free to all Keyano students and employees. • Microphone, webcam and speakers. A headset with a microphone is recommended. • System updates must be regularly installed. • Anti-Virus / Anti-Malware software 	<p>Minimum Requirements:</p> <ul style="list-style-type: none"> • A Macintosh (V10.14 and above) computer/laptop • Minimum 4GB of RAM. • 10GB+ available hard drive storage. • Enough available hard drive space to install the Microsoft Office suite (approximately 3GB). <u>Microsoft Office</u> software is free to all Keyano students and employees. • Microphone, webcam and speakers. A headset with a microphone is recommended. • System updates must be regularly installed. • Anti-Virus / Anti-Malware software.
<p>Recommended Requirements</p> <ul style="list-style-type: none"> • 8GB of RAM • A method of backing up/synchronizing to local or cloud-based storage such as OneDrive is highly recommended. This is included if you complete the setup of KeyanoMail and download MS Office using your Keyano email for free. 	<p>Recommended Requirements</p> <ul style="list-style-type: none"> • 8GB of RAM • A method of backing up/synchronizing to local or cloud-based storage such as OneDrive is highly recommended. This is included if you complete the setup of KeyanoMail and download MS Office using your Keyano email for free.

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<p>Chromebooks are not recommended as they are not compatible with testing lockdown browsers. A Microsoft Surface or iPad or iPad Pro may be possible alternatives in some program areas.</p>	

Computer Software

Students will be able to get access to Microsoft Office 365 for Free using Keyano Credentials by [clicking here](#).

Recording of lectures and Intellectual Property

Students may only record a lecture if explicit permission is provided by the instructor or by Accessibility Services. Even if students have permission to record a lecture or lecture materials, students may not publish any of the lectures or lecture materials, this includes any recordings, slides, instructor notes, etc. on any platform. Thus no student is allowed to publish or sell instructor notes without formal written permission. It is important to recognize that the Canadian Copyright Act contains provisions for intellectual property.

ITS Helpdesk

If you are having issues with your student account, you can contact the ITS Helpdesk by emailing its.helpdesk@keyano.ca or calling 780-791-4965.

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