College and Career Preparation

Winter, 2023

MATH 30-1A, Mathematics 30-1
5 credits, 6 hours lectures per week

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

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Office Hours

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

Hours of Instruction

Monday	9:00 - 10:50 am	Room CC 225
Tuesday	9:00 - 10:50 am	Room CC 225
Thursday	9:00 - 10:50 am	Room CC 225

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 $y = \log_c x, c > 0, C \neq I$
- 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(1imited 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

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*

Evaluation

Assignments	10%
Tests	20%
Mid Term	30%
Final Exam	40%
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
	3.3	81 – 84
Good	3.0	77 – 80
	2.7	73 – 76
	2.3	69 – 72
Satisfactory	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

Performance Requirements and Student Services

Student Responsibilities

As a student, it is your responsibility to contact the Office of the Registrar to complete the required forms, including the Withdraw Course or Program or a Change of Registration form. Please refer to the important dates listed in the Academic Schedule in the [Keyano College credit calendar](#). The Keyano College credit calendar also has information about Student Rights and the Code of Conduct. It is the responsibility of each student to be aware of the guidelines outlined in the Student Rights and the Code of Conduct Policies.

Student Attendance

Class attendance is helpful for two reasons: First, class attendance maximizes a student's learning experience. Second, attending class is an excellent way to keep informed of matters relating to the course administration (e.g., the timing of assignments and exams). Ultimately, you are responsible for your learning and performance in this course. It is the responsibility of each student to be prepared for all classes. Absent students are responsible for the material covered in those classes, and students must ensure they are ready for their next class, including completing any missed assignments and notes.

Academic Misconduct

Students are considered responsible adults and should adhere to the principles of intellectual integrity. Intellectual dishonesty takes many forms:

- Plagiarism or the submission of another person's work as their 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,
- Submitting unchanged work 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. To ensure your understanding of plagiarism, you may be required to complete the online Understanding Plagiarism tutorial and submit the certificate of completion.

Online Learning

Technology and internet connectivity will impact your online learning experience. You may be required to watch online videos, take online quizzes, or participate in live online classes. Live/virtual courses will be hosted in Microsoft Teams or Zoom. For all course delivery types, you will access your course resources on Keyano's learning management system: Moodle (iLearn). Login in using your Keyano username and password. Keyano College operates in a Windows-based environment and having access to the correct tools for online learning is essential.

Internet Speed

Minimum download and upload speeds of 10 Mbps. Recommended download speeds of 25 Mbps and upload speeds of 10 Mbps (if you are sharing your internet at home). You can check your internet speed with Speedtest by Ookla.

Computer System Requirements

Keyano College software are Windows based.

Minimum Requirements and Recommended Upgrades for Windows (preferred system) and Apple devices
These minimum standards are required for a Windows computer/laptop (OS 10 or 11) and a MacIntosh (OS 10.14 or above.
1. Windows 10 Operating System or above 2. 4GB of RAM. Recommended upgrade to 8GB of RAM. 3. 10GB+ available hard drive storage space. Note installing Microsoft Office 365 requires 3GB of available hard drive space.   a.   Install the Microsoft Office 365 suite (~3GB) * 4. Microphone, webcam, and speakers (All modern laptops have these three accessories built-in. However, a headset or earbuds with a microphone is also recommended. 5. Windows has built-in anti-virus/malware software. It is essential to install system updates to keep your device secured regularly.
*Microsoft Office 365 is free to Keyano students.
Tablets, iPads, and Chromebooks are **not** recommended: they may not be compatible with the testing lockdown browsers and Microsoft Office 365.

Computer Software

Students have access to Microsoft Office 365 and Read & Write for free using Keyano credentials.

See Recommended Technology for more information.

Recording of Lectures and Intellectual Property

Students may only record a lecture if explicit permission is provided by the instructor or Accessibility Services. Even if students have permission to record a lecture or lecture materials, students may not share, distribute, or publish any of the lectures or course materials; this includes any recordings, slides, instructor notes, etc., on any platform. Thus, no student is allowed to share, distribute, publish or sell course-related content without permission. It is important to recognize that the Canadian Copyright Act contains provisions for intellectual property. The Academic Integrity Policy provides additional information on Keyano College's expectations from students as members of the intellectual community.

ITS Helpdesk

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

Specialized Supports
The Student Services Department is committed to Keyano students and their academic success. There is a variety of student support available at Keyano. All student services are available during Keyano business hours: Monday to Friday, 8:30 a.m. to 4:30 p.m. The College is closed on statutory holidays. If you require support outside of regular business hours, please inform the support service team, and they will do their best to accommodate your needs.

Accessibility Services provides accommodations for students living with disabilities. Students with documented disabilities or who suspect a disability can meet with an Access Strategist to discuss their current learning barriers and possible accommodations. Students who have accessed accommodations in the past are encouraged to contact the department to request accommodations for the following semester. Please note that requesting accommodations is a process and requires time to arrange. Contact the department as soon as you know you may require accommodations. For accessibility supports and disability-based funding, please book an appointment by emailing us at: accessibility.services@keyano.ca.

Accessibility Services also provides individual and group learning strategy instruction for all students and technology training and support to enhance learning. You can meet with an Access Strategist to learn studying and test-taking strategies. In addition, you can 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 provide a safe and confidential environment for you to seek help with personal concerns. Our Wellness Navigator offers support with basic needs such as housing, financial and nutritional support, and outside referrals when needed. Wellness Services welcomes students to participate in group sessions that address topics including mindfulness and test anxiety throughout the academic year. Individual appointments can be made by emailing wellness.services@keyano.ca.

Library Services provides students with research, information, and educational technology supports as they engage in their studies. Library staff are available to help you online and in person throughout the semester. Librarians offer individual and small group consultations booked using the online Book A Librarian calendar. The library also provides virtual research and subject guides to help you with your studies. Find the guide that supports your course-related research by viewing the complete list of online Subject Guides. To start your research and access citation guides (APA, MLA, Chicago, or IEEE), visit the Research Help page. The library's collections (including print and online materials) are searchable using OneSearch. The library offers a Loanable Technology collection to support students accessing and using technology. For an up-to-date list of technology available for borrowing, visit the library's Loanable Technology webpage. For a detailed list of library resources and services, go to www.keyano.ca/library. For all inquiries, please email askthelibrary@keyano.ca or chat with us online.

The **Academic Success Centre** at Keyano College (CC-119) provides **free** academic support services to registered students, such as tutoring, writing support, facilitated study groups, workshops, and study space. Academic Content Specialists are available in Mathematics, Science, Trades, Power Engineering, Upgrading/College Prep, Human Services, English, Humanities, and more. Students are encouraged to visit the Academic Success Centre to discuss study strategies and academic concerns. For additional information, please email Academic.Success@keyano.ca.

The **Academic Success Coach** is located in the Academic Success Centre and works with students to develop academic success plans, time management skills, study strategies, and homework plans. For additional information, please email Academic.Success@keyano.ca.