College and Career Preparation

Winter, 2018

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
CC205T
780-791-4835
leni.cherian@keyano.ca

Office Hours

Monday	12:00 – 12:50 pm
Tuesday	12:00 – 12:50 pm
Wednesday	11:00 - 12:50 pm
Thursday	12:00 - 12:50 pm

Hours of Instruction

Monday	10:00 – 11:50 pm	Room 233
Tuesday	10:00- 11:50 pm	Room 233
Thursday	10:00 – 11:50 pm	Room 233

Required Resources

Precalculus12, McGraw- Hill Ryerson, ISBN: 978-007-073-8720
TI-83 Plus Calculator
Ruler
Graph Paper

Course Outcomes

Upon successful completion of the course, the student shall 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

Evaluation

Unit Assignments	10%
Mid Term 1	25%
Mid Term 2	25%
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

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 and 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.

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 / or 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
- 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 Student 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 Student 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 will not be graded until you show this signed certificate.

Specialized Supports

Counselling and Accessibility Services

Counselling Services provides a wide range of specialized counselling services to prospective and registered students, including personal, career and academic counselling.

SKILL Centre

The SKILL Centre is a learning space in the Clearwater Campus at Keyano College where students can gather to share ideas, collaborate on projects and get new perspectives on learning from our tutorial staff.

The SKILL Centre, through a variety of delivery methods, provides assistance in skill development to Keyano students. Assistance is provided by instructors, staff and student tutors. Individuals wishing to improve their mathematics, writing, grammar, study, or other skills, can take advantage of this unique service.