

NEW YORK CITY COLLEGE OF TECHNOLOGY
The City University of New York

DEPARTMENT:	Mathematics
COURSE:	MAT 1275
TITLE:	College Algebra and Trigonometry
DESCRIPTION:	An intermediate and advanced algebra course. Topics include quadratic equations, systems of linear equations, exponential and logarithmic functions; topics from trigonometry, including identities, equations and solutions of triangles.
TEXT:	College Algebra and Trigonometry by Alexander Rozenblyum, 2018 edition
CREDITS:	4
PREREQUISITES:	MAT 1175 OR for New Students, scores of at least 45 on the Pre-Algebra part and 45 on the Algebra part of the CUNY Assessment Test in Mathematics.

Prepared by Professor Alexander Rozenblyum (Spring 2019)

A. Testing/Assessment Guidelines:

The following exams should be scheduled:

1. A one-hour exam at the end of the First Quarter.
2. A one session exam at the end of the Second Quarter.
3. A one-hour exam at the end of the Third Quarter.
4. A one session Final Examination.

B. A scientific calculator is required.

COURSE INTENDED LEARNING OUTCOMES/ASSESSMENT METHODS

LEARNING OUTCOMES	ASSESSMENT METHODS
1. Solve <ul style="list-style-type: none">• Linear and fractional equations• One-variable quadratic equations by factoring, completing the square, and the quadratic formula• Radical and exponential equations• Systems of equations	Classroom activities and discussion, homework, exams.
2. Perform operations with and simplify polynomial, rational, radical, complex, exponential, and logarithmic expressions.	Classroom activities and discussion, homework, exams.
3. Apply their knowledge of algebra and trigonometry to solve verbal problems.	Classroom activities and discussion, homework, exams.
4. <ul style="list-style-type: none">• Solve problems involving right and oblique triangles.• Prove trigonometric identities.• Solve trigonometric equations• Graph the sine and cosine function.	Classroom activities and discussion, homework, exams.
5. Apply the distance and midpoint formulas and determine the graphs of circles and parabolas.	Classroom activities and discussion, homework, exams.

GENERAL EDUCATION LEARNING OUTCOMES/ASSESSMENT METHODS

LEARNING OUTCOMES	ASSESSMENT METHODS
1. Understand and employ both quantitative and qualitative analysis to solve problems.	Classroom activities and discussion, homework, exams.
2. Employ scientific reasoning and logical thinking.	Classroom activities and discussion, homework, exams.
3. Communicate effectively using written and oral means.	Classroom activities and discussion, homework, exams.
4. Use creativity to solve problems.	Classroom activities and discussion, homework, exams.

MAT 1275 - College Algebra and Trigonometry
Course Outline

Textbook: College Algebra and Trigonometry by Alexander Rozenblyum, 2018 edition

WeBWorK: WeBWorK for MAT1275 uses the OpenLab Q&A site: <https://openlab.citytech.cuny.edu/ol-webwork/> Students will need an OpenLab account in order to post new questions.

Video Resources: All video resources listed below can be found at <https://openlab.citytech.cuny.edu/math1275videolibrary/syllabus-with-links-to-videos/>

Class	Chapter/Lesson	Suggested Class Problems	Homework	WeBWorK Set	Video Resources
1	1) Integer Exponents, p.2-8	p.7-8: 1.1-1.21 odd	p.7-8: 1.2-1.22 even	IntegerExponents	Integer exponents
2	2) Rational Expressions and Complex Fractions, p.9-20	p.18-20: 2.1-2.37 odd	p.18-20: 2.2-2.38 even	ReducingRationalExpressions AddRationalExpressions AddRationalExpressions2 ComplexFractions-Method1 ComplexFractions-Method2	Adding and subtracting rational expressions Multiplying and dividing rational expressions Complex fractions
3	3) Rational Equations, p.21-26	p.26: 3.1-3.13 odd	p.26: 3.2-3.14 even	FractionalEquations	Solving rational equations
4	4) Radicals and Fractional Exponents, p.27-33	p.33: 4.1-4.13 odd	p.33: 4.2-4.14 even	HigherRoots HigherRoots-Algebraic SimplifyingRadicals RationalExponents	Rational exponents and radicals Roots and radicals
5	5) Multiplication, Addition and Subtraction Radicals, p.34-38	p.38: 5.1-5.21 odd	p.38: 5.2-5.22 even	MultiplyRadicals AddSubtractRadicals	Adding and subtracting radical expressions Multiplying radical expressions
6	6) Rationalizing the Denominators and Solving Radical Equations, p.39-43	p.43: 6.1-6.23 odd	p.43: 6.2-6.24 even	RationalizeDenominators RadicalEquations	Division of radicals and rationalization Solving radical equations
7	7) Complex Numbers, p.44-48	p.48: 7.1-7.9 odd	p.48: 7.2-7.10 even	ComplexNumbers	Complex numbers
8	8) Quadratic Equations: Factoring and Square Forms, p.49-56	p.55: 8.1-8.11 odd	p.55: 8.2-8.12 even	SquareRootProperty	Zero product property and solving quadratic equations by factoring
9	Exam 1				
10	9) Completing the Square and Quadratic Formula, p.57-63	p.63: 9.1-9.3 odd	p.63: 9.2-9.4 even	SquareRootProperty QuadraticFormula	The square root property The quadratic formula Applications of the quadratic formula
11	10) Parabolas, p.64-74	p.72-74: 10.1-10.7 odd	p.72-74: 10.2-10.8 even	ParabolaVertices ParabolaVertices-CtS ParabolaVertices-VertexFormula ShiftingParabolas	Graphs of quadratic functions Shifting parabolas
12	11) Distance Formula, Midpoint Formula, and Circles, p.75-80	p.80: 11.1-11.13 odd	p.80: 11.2-11.14 even	DistanceFormula Circles	Pythagorean Theorem Distance formula Midpoint formula Circles Perpendicular bisectors

Class	Chapter/Lesson	Suggested Problems	Class	Homework	WeBWorK Set	Video Resources
13	12) Systems of Three Linear Equations in Three Variables, p.81-86	p.86: 12.1		p.86: 12.2	3 × 3-Systems	Linear systems of three variables
14	13) Determinants and Cramer's Rule, p.87-93 (Optional)	p.93: 13.1-13.5 odd		p.93: 13.2-13.6 even		Determinants and Cramer's rule
15	14) Nonlinear Systems of Equations in Two Variables, p.94-97	p.97: 14.1-14.3 odd		p.97: 14.2-14.4 even	NonLinearSystems	Nonlinear systems of equations
16	15) Geometric and Trigonometric Angles, p.99-104	p.104: 15.1-15.5 odd		p.104: 15.2-15.6 even	SpecialTriangles	Special triangles
17	Exam 2 (Midterm)					
18	16) Trigonometric Functions for Acute Angles, p.105-113	p.112: 16.1-16.11 odd		p.112: 16.2-16.12 even	TrigonometryRatios SolvingRightTriangles SolvingRightTriangles-InverseTrig	Trigonometry of right triangles
19	17) Trigonometric Functions for Arbitrary Angles, p.114-122	p.121-122: 17.1-17.11 odd		p.121-122: 17.2-17.12 even	CoordinatePlaneTrig	Unit circle
20	18) Solving Oblique Triangles - Law of Sines, p.123-131	p.130: 18.1-18.7 odd		p.130: 18.2-18.8 even	LawOfSines	Law of sines
21	19) Solving Oblique Triangles - Law of Cosines, p.132-137	p.137: 19.1-19.5 odd		p.137: 19.2-19.6 even	LawOfCosines	Law of cosines
22	20) Radian Measure of Angles, p.138-144	p.143: 20.1-20.11 odd		p.143: 20.2-20.12 even	AngleMeasure-Radians UnitCircle	Angle measure in radians
23	21) Graphs and Simplest Equations for Basic Trigonometric Functions, p.145-154	p.154: 21.1-21.7 odd		p.154: 21.2-21.8 even	GraphingSineCosine TrigEquations	Graphs of sine, cosine, and tangent Trigonometric equations
24	22) Trigonometric Identities and None-Simplest Equations, p.155-160	p.160: 22.1-22.13 odd		p.160: 22.2-22.14 even		Pythagorean identity (The fundamental identity of trigonometry)
25	Exam 3					
26	23) Logarithms, p.162-168	p.168: 23.1-23.11 odd		p.168: 23.2-23.12 even	LogarithmicFunctions LogarithmicProperties ExponentialFunctions ExponentialEquations ExponentialEquations-Calc	Properties of logarithms Exponential equations
27	24) Exponential and Logarithmic Functions, p.169-176	p.175-176: 24.1-24.9 odd		p.175-176: 24.1-24.10 even		Exponential functions Logarithmic functions
28	25) Compound Interest and Number e , p.177-183	p.183: 25.1-25.5 odd		p.183: 25.2-25.6 even	CompoundInterest	Compound interest
29	Review					Selected final exam review questions solved
30	Final Exam					