# Math 103 - College Algebra 

Summer, 2022
Online, Asynchronous

| Instructor: | Amanda Zerr |  |
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| Office Hours: | Tues, 9 -10 \& by appointment | Zoom Office: 9528242751 |
| Contact: | E-mail: azerr@hawaii.edu | Phone: 236-9279 |
| Effective Date: | Summer 2022 |  |
| Website: | Course Laulima Site |  |

## WINDWARD COMMUNITY COLLEGE MISSION STATEMENT

Windward Community College offers innovative programs in the arts and sciences and opportunities to gain knowledge and understanding of Hawai'i and its unique heritage. With a special commitment to support the access and educational needs of Native Hawaiians, we provide the Ko'olau region of O'ahu and beyond with liberal arts, career and lifelong learning in a supportive and challenging environment - inspiring students to excellence.

## CATALOG DESCRIPTION

Math 103 investigates linear equations, inequalities, systems of equations, polynomials, functions, fractional expressions and equations, exponents, powers, roots, quadratic equations and functions; rational, exponential and logarithmic functions. (4 hours lecture)

Pre-Requisites: C or better in MATH 25, 26, 29, 82 or equivalent, satisfactory math placement test score, or consent of instructor.

## ACTIVITIES REOUIRED AT SCHEDULED TIMES OTHER THAN CLASS TIME

Students are required to attend proctored exams via Zoom. Contact the instructor if an alternate testing time is needed.
Wed. June 8, 9-11 am, Exam 1
Tues June 21, 9-11 am, Exam 2
Fri July 1, $9-11$ am, Exam 3
Wed July 6, 9-11:30 am, Final Exam

## STUDENT LEARNING OUTCOMES (SLO)

As a result of taking this course, students can expect to attain the following outcomes:

1. Graph or interpret algebraic relations that are relevant to the topics in this course.
2. Employ algebraic techniques to find the solutions to equations or inequalities, or systems of equations or inequalities appropriate to the level of this course.
3. Use algebraic techniques to analyze and solve applied problems.
4. Utilize precise mathematical language and symbols to effectively communicate mathematics in written and/or oral form

Note: All SLO assessments are embedded in class activities, homework, quizzes or exams.

## FOUNDATION HALLMARKS

Math 103 fulfills 4 credits of the General Education requirements Foundations: Quantitative (FQ) for both an A.A. degree at WCC and a Bachelor's degree at UH Manoa. The primary goal of FQ courses is to develop mathematical reasoning skills at the college level. Students apply mathematical concepts to the interpretation and analysis of quantifiable information in order to solve a wide range of problems arising in pure and applied research in specific disciplines, professional settings, and/or daily life. Consequently, this course meets the following hallmarks of the Quantitative Reasoning requirement:

1. Provide students with theoretical justifications for, and limitations of, mathematical or statistical methods, and the formulas, tools, or approaches used in the course.
2. Include application of abstract or theoretical ideas and information to the solution of practical quantitative reasoning problems arising in pure and applied research in specific disciplines, professional settings, and/or daily and civic life.
3. Provide opportunities for practice and feedback that are designed to help students evaluate and improve quantitative reasoning skills by including a course component at least once per week with a maximum 30:1 student-to-teacher ratio.
4. Be designed so that students will be able to:
a. identify and convert relevant quantitative information into various forms such as equations, graphs, diagrams, tables, and/or words;
b. select appropriate techniques or formulas, and articulate and evaluate assumptions of the selected approaches;
c. apply mathematical tools and perform calculations (including correct manipulation of formulas);
d. make judgments, create logical arguments, and/or draw appropriate conclusions based on the quantitative analysis of data, the assumptions made, the limitations of the analysis, and/or the reasonableness of results; and effectively communicate those results in a variety of appropriate formats.

## COURSE TASKS

This online class is conducted fully online via an asynchronous format., i.e. there are no required time-specific meetings. Students will take responsibility for their own learning by:

- Engaging with the Laulima videos \& lessons
- Using the section in the eBook to analyze more worked examples and read more detailed explanations of the concepts
- Completing weekly online homework using Pearson's MyLab Math, analyzing errors, and asking specific questions to clarify misunderstandings
- Completing three exams and the comprehensive final exam


## ASSESSMENT TASKS

## High Quality Written Work

The student will demonstrate competency in the objectives by completing online homework assignments, in-class discussions, tests, and a comprehensive final exam. Math 103 fulfills 4 credits of the General Education requirements of Foundations Quantitative (FQ). This means that students' written work on exams must clearly and logically explain the mathematical concepts being addressed. Messy, incomplete and/or disorganized work will not receive full credit.

## Homework

- Homework will be completed online via the MyLab Math (MLM) program.
- You can retry MLM problems an unlimited number of times until you get them correct. If there is a valid reason you can't get a homework assignment done by the deadline, please contact the instructor with an explanation to be considered for a possible extension. Unexcused late homework will receive a 10\% deduction.


## Tests

- The exams will be available on MyLab Math and proctored by the instructor via Zoom. Students must submit their exam and upload written work on Laulima.
- Tests without written work will earn a zero.
- Written work needs to show a logical pathway to the answer using concepts from the class. Incomplete and/or disorganized written work will not earn full credit.
- There are no retests on exams. Deadlines will not be extended except for valid extenuating circumstances
- It is ok to use one page of notes and a non-graphing calculator when taking exams.
- It is not ok to use a graphing calculator, other technology, or other people to help you on exams.
- Questions are randomized so no students have the same test.


## Final Exam

The final exam is a 2 hour test covering concepts and skills in the entire course. The purpose of the final exam is to synthesize your understanding of the learning objectives so that you can succeed in future classes and career goals. The Final Exam score can replace one Unit Exam score, if it is higher. The same rules apply on the final exam as the other exams in the course.

## GRADING - Experience Points (XP)

Grades are posted on the Laulima XP tab and are based on the following weighted categories:

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45% 3 Unit Exams (100 points each)
20% Final Exam (100 points)
35% Homework (50 assignments, approximately 20 points each)
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You will receive a letter grade based on the following scale. Grades are rounded up so that $89.5 \%=A$, whereas $89.4 \%=B$.
A 90\%-100\%
B $80 \%-89 \%$
C $70 \%-79 \%$
D 60\%-69\%
F Less than 60\%
W Official Withdrawal (by posted deadline)

## LEARNING RESOURCES

## Required Materials

1. Technology. Students must have access to a computer, the Internet, and use their UH hawaii.edu e-mail account to participate in this class.
2. MyLab Math (MLM) is our online learning program for homework and assessments. You are automatically enrolled when you sign up for this class!
3. Textbook. You will have automatic access to the online eBook version of our textbook (Algebra for College Students, 9th Ed. Lial, Hornsby, McGinnis. ISBN-10: 0135160669). If you prefer a printed book, I recommend buying a used version.
4. Calculators. Non-graphing calculators are allowed on homework and exams.
5. Laulima. The syllabus, course outline, grades, and additional learning resources are all available through Laulima.

## Notebook

I recommend that you keep an organized homework notebook in which you complete all your online assignments by hand, the same way you would complete paper assignments. You should write each problem in your notebook and neatly solve it, and then enter your answer online. This will help you prepare for your exams which require high-quality written work.

## Additional Learning Resources

- Tutor.com- Free online, on-demand tutoring. Sign in to myUH for free access to the program.
- Ka Piko Math Lab - Free online drop-in tutoring with WCC students who have been successful in Math 140 and above.
- TRiO Student Support Services - Free individual and/or small group tutoring, financial assistance, computer lab \& printing, early class registration, income tax services, food, and so much more!
- Testing Center- La'akea Room 228. Phone number (808)235-7498


## ADDITIONAL INFORMATION

## Communication

It is your responsibility to stay in communication with the instructor. If you are unable to complete assignments for any reason, please inform your instructor so it may be determined if extensions are needed. The instructor may need to contact you throughout the semester and will do so via email. It is your responsibility to check your student email on a regular basis.

## Contacting the Instructor

There are two easy ways to contact me.

- Email me via your UH school email
- Select "Ask My Instructor" in MyLab Math

I will be available Monday - Friday and will reply to any questions and posts within 24 hours during the week and by the next business day hours on weekends and holidays. When contacting me with questions or concerns, please include your full name \& MATH 103 in the title of the message. If you are asking about a specific homework problem, include the section and question number.

Alternative Contact
If you are unable to contact the instructor, have questions that your instructor cannot answer, or for any other issues, please contact the Academic Affairs Office. Email: wccaa@hawaii.edu Phone: 808-235-7422

## SAFE SPACE

At WCC we strive to treat each other with respect and I welcome individuals of all ages, backgrounds, beliefs, ethnicities, genders, gender identities, gender expressions, national origins, religious affiliations, races, sexual orientations, ability, and other visible and nonvisible differences. All members of this class are expected to contribute to a respectful, welcoming and inclusive environment for every other member of the class. However, while it might not be intentional, we can all make mistakes. If you feel continuously disrespected even after you have asked the perpetrator to stop please email me and/or file a grievance with the Vice Chancellor of Student Affairs. If you witness a classmate
 being harassed, please stand up for them and offer support.

## GROWTH MINDSET

Picture yourself as a toddler learning to walk. Think of how many times you had to fall and get back up. Failure is a natural part of learning something new. When learning new concepts, your brain is creating new synapse connections. Frustration and struggle are signs that you are in the middle of the learning process. Don't give up! Good strategies and continued practice lead to stronger synapse connections and allow your brain to store the new concepts in long-term memory. You build your intelligence as you practice and learn new concepts. Click here to learn more about research into the growth mindset.

## HOW TO LEARN MATH

The most important things: stay caught up and do the homework. In math, every skill builds on previous skills. If you get behind, then the new material you're trying to learn won't make sense because you're missing the foundational skills from previous weeks. Want to succeed in math? Do the homework. Then ask specific questions of me or a tutor on the material you don't understand, then do more homework. The way to learn math is to do math. There is no substitute and no one can do it for you. Just like if I want to get fit, I have to do the work. I sure wish I could just sit back and watch a video of someone else working out and reassure myself that I could do it too. Unfortunately as much as I've tried, wishful thinking and procrastination don't get me fit. Same with math. Stay caught up and do the work.

## SYLLABUS CHANGE POLICY

Information contained in the course syllabus may be subject to change with reasonable advance notice, as deemed appropriate by the instructor. Updates to the syllabus will be communicated via email and the updated syllabus will be posted on Laulima.

## STUDENT CONDUCT \& ACADEMIC HONESTY

Students are required to comply with the UH Student Conduct Code including policies that prohibit Academic Dishonesty. See the WCC Catalog and the WCC Student Conduct Policy for more information.

Do not cheat yourself of an opportunity to learn. Doing the work yourself gives you a chance to master new material and further your education. Work submitted by a student must be the student's own work. Students who commit academic dishonesty, cheating or plagiarism will receive a failing grade for plagiarized assignments and be referred to the Vice Chancellor for Student Affairs.

## DISABILITIES \& ACCOMMODATIONS

If you have a physical, sensory, health, cognitive, or mental health disability that could limit your ability to fully participate in this class, you are encouraged to contact the Accessibility Counselor to discuss reasonable accommodations that will help you succeed in this class. Roy Inouye can be reached at (808) 235-7453, royinouy@hawaii.edu, or you may stop by Hale Kāko'o 106 for more information.

## SEX DISCRIMINATION AND GENDER-BASED VIOLENCE RESOURCES (TITLE IX)

Windward Community College is committed to providing a learning, working, and living environment that promotes personal integrity, civility, and mutual respect and is free of all forms of sex discrimination and gender-based violence, including sexual assault, sexual harassment, gender-based harassment, domestic violence, dating violence, and stalking.

If you or someone you know is experiencing any of these, WCC has staff and resources to support and assist you. To report an incident of sex discrimination or gender-based violence, as well as receive information and support, please contact one of the following:
UH Confidential Advocate
(808) 348-066

Email: advocate@hawaii.edu
Desrae Kahale, Mental Health Counselor \& Confidential Resource
Phone: (808) 235-7393
Email: dkahale3@hawaii.edu
Office: Hale Kāko'o 101
Karla K. Silva-Park, Title IX Coordinator
Phone: (808) 235-7468
Email: karlas@hawaii.edu
Office: Hale Kāko'o 128
As a member of the University faculty, I am required to immediately report any incident of sex discrimination or gender-based violence to the campus Title IX Coordinator. Although the Title IX Coordinator and I cannot guarantee confidentiality, you will still have options about how your case will be handled. My goal is to make sure you are aware of the range of options available to you and have access to the resources and support you need. For more information regarding sex discrimination and gender-based violence, the University's Title IX resources and the University's Policy, Interim EP 1.204, go to manoa.hawaii.edu/titleix/

The following schedule is subject to change. Should changes occur, you will be notified via email.

Homework is due by 9 am the day after it is assigned (unless otherwise noted).

|  | Monday | Tuesday | Wednesday | Thursday | Friday |
| :---: | :---: | :---: | :---: | :---: | :---: |
| June | MAY 30 <br> Labor Day | MAY 31 <br> MyLab Tutorial R.2, R.4, 1.1 | $\begin{aligned} & 1 \\ & 1.5,1.6,1.7 \end{aligned}$ | $\begin{aligned} & 2 \\ & 2.1,2.2,2.3 \end{aligned}$ | $\begin{aligned} & 3 \\ & 2.4,2.5,2.6 \end{aligned}$ |
|  | $\begin{aligned} & 6 \\ & 3.1,3.2,3.3 \end{aligned}$ | 7 <br> Exam 1 Review | 8 <br> Tutoring <br> 2-3 <br> Meeting Link <br> Passcode: <br> 7BmdFh | $\begin{aligned} & 9 \\ & 9-11 \mathrm{am} \\ & \text { Exam } 1 \\ & \text { https://hawaii.zo } \\ & \hline \underline{\text { om.us/i/952824 }} \\ & \hline \mathbf{2 7 5 1} \end{aligned}$ | 10 King <br> Kamehameha I <br> Day <br> Last day to withdraw <br> 4.1, 4.3, 4.4, <br> 4.5 (due <br> Monday) |
|  | $\begin{aligned} & 13 \\ & 4.6,5.4,5.5 \end{aligned}$ | $14$ $6.1,6.2,6.3$ | $\begin{aligned} & 15 \\ & 6.4,6.5,6.6 \end{aligned}$ | $\begin{aligned} & 16 \\ & 7.1,7.2,7.3 \end{aligned}$ | $\begin{aligned} & 17 \\ & 7.4,7.5,7.6 \end{aligned}$ |
|  | $20$ <br> 7.7, Exam 2 Review | 21 <br> 9-11am <br> Exam 2 <br> https://hawaii.zo <br> om.us/j/9528242 <br> 751 | $\begin{aligned} & 22 \\ & 8.1,8.2,8.3 \end{aligned}$ | $\begin{aligned} & 23 \\ & 8.4,8.5,9.1 \end{aligned}$ | $\begin{aligned} & 24 \\ & 9.3,10.2,10.3 \end{aligned}$ |
| July | $\begin{aligned} & 27 \\ & 10.4,10.5, \\ & 10.6 \end{aligned}$ | $\begin{aligned} & 28 \\ & 11.4,12.1 \end{aligned}$ | $\begin{aligned} & 29 \\ & 12.3,12.4 \end{aligned}$ | $30$ <br> Exam 3 Review | 1 <br> 9-11am <br> Exam 3 <br> https://hawaii.zo <br> om. $\mathrm{us} / \mathrm{j} / 952824$ <br>  |
|  | 4 Holiday | 5 <br> Final Exam Review | 6 <br> 9-11:30 am Cumulative Final Exam https://hawaii.z oom. us $/ / 95282$ 42751 | 7 | 8 |

Use this list to determine which video lessons to watch in MyLab Math.

## Chapter R

Section R. 2 Basic Concepts from Algebra
OB. 1 - Write Sets using Set Notation
OB. 5 - Use Absolute Value
Section R. 4 Exponents, Roots, and Order of Operations
OB. 3 - Use the rules for Order of Operations
Chapter 1
Section 1.1 - Linear Equations in One Variable
OB. 1 - Distinguish between Expressions and Equations
OB. 2 - Identify Linear Equations
OB. 3 - Solve Linear Equations using the Addition and Multiplication Properties of Equality
OB. 4 - Solve Linear Equations using the Distributive Property
OB. 5 - Solve Linear Equations with Fractions or Decimals
OB. 6 - Identify Conditional Equations, Contradictions, and Identities

## Section 1.5 - Linear Inequalities in One Variable

OB. 1 - Graph Intervals on a Number Line
OB. 2 - Solve Linear Inequalities using the Addition Property
OB. 3 - Solve Linear Inequalities using the Multiplication Property
OB. 4 - Solve Linear Inequalities with Three Parts
Section 1.6 - Set Operations and Compound Inequalities
OB. 1 - Recognize Set Intersection and Union
OB. 2 - Find the Intersection of Two Sets
OB. 3 - Solve Compound Inequalities with the word and
OB. 4 - Find the Union of Two Sets
OB. 5 - Solve Compound Inequalities with the word or
Section 1.7 - Absolute Value Equations and Inequalities
OB. 1 - Use the Distance Definition of Absolute Value
OB. 2 - Solve Equations of the form $|a x+b|=k$, for $k>0$
OB. 3 - Solve Inequalities of the form $|a x+b|<k$ and of the form $|a x+b|>k$, for $k>0$
OB. 4 - Solve Absolute Value Equations that involve rewriting
OB. 5 - Solve Equations of the form $|a x+b|=|c x+d|$
OB. 6 - Solve Special Cases of Absolute Value Equations and Inequalities

## Chapter 2

Section 2.1 - Linear Equations in Two Variables
OB. 1 - Interpret a Line Graph
OB. 2 - Plot Ordered Pairs
OB. 3 - Find Ordered Pairs that satisfy a given Equation
OB. 4 - Graph Lines
OB. 5 - Find $x$ - and $y$-intercepts
OB. 6 - Graph Equations of Horizontal and Vertical Lines

OB. 7 - Find the Midpoint of a Line Segment

## Section 2.2 - The Slope of a Line

OB. 1 - Find the Slope of a Line given Two Points on the Line
OB. 2 - Find the Slope of a Line given an Equation of the Line
OB. 3 - Graph a Line given its Slope and a Point on the Line
OB. 4 - Determine whether Two Lines are Parallel, Perpendicular, or neither using Slope
OB. 5 - Solve problems involving Average Rate of Change
Section 2.3 - Writing Equations of Lines
OB. 1 - Write an Equation of a Line given its Slope and $y$-intercept
OB. 2 - Graph a Line using its Slope and y-intercept
OB. 3 - Write an Equation of a Line given its Slope and a Point on the Line
OB. 4 - Write an Equation of a Line given Two Points on the Line
OB. 5 - Write Equations of Horizontal and Vertical Lines
OB. 6 - Write an Equation of a Line Parallel or Perpendicular to a given Line
OB. 7 - Write an Equation of a Line that Models Real Data
Section 2.4 - Linear Inequalities in Two Variables
OB. 1 - Graph Linear Inequalities in Two Variables
OB. 2 - Graph the Intersection of Two Linear Inequalities
OB. 3 - Graph the Union of Two Linear Inequalities
Section 2.5 - Introduction to Relations and Functions
OB. 1 - Devine and Identify Relations and Functions
OB. 2 - Find the Domain and Range
OB. 3 - Identify Functions defined by Graphs and Equations

## Section 2.6 - Function Notation and Linear Functions

OB. 1 - Use Function Notation
OB. 2 - Graph Linear and Constant Functions
Chapter 3

## Section 3.1 - Systems of Linear Equations in Two Variables

OB. 1 - Determine whether an Ordered Pair is a Solution of a Linear System
OB. 2 - Solve Linear Systems by Graphing
OB. 3 - Solve Linear Systems (with Two Equations and Two Variables) by Substitution
OB. 4 - Solve Linear Systems (with Two Equations and Two Variables) by Elimination
OB. 5 - Solve Special Systems

## Section 3.2 - System of Linear Equations in Three Variables

OB. 1 - Understand the Geometry of Systems of Three Equations in Three Variables
OB. 2 - Solve Linear Systems (with Three Equations and Three Variables) by Elimination
OB. 3 - Solve Linear Systems (with Three Equations and Three Variables)
OB. 4 - Solve Special Systems

## Section 3.3 - Applications of Systems of Linear Equations

OB. 1 - Solve Geometry Problems using Two Variables
OB. 2 - Solve Money Problems using Two Variables
OB. 3 - Solve Mixture Problems using Two Variables
OB. 4 - Solve Distance-Rate-Time Problems using Two Variables
OB. 5 - Solve Problems with Three Variables using a System of Three Equations

## Chapter 4

## Section 4.1 - Integer Exponents

OB. 1 - Use the Product Rule for Exponents
OB. 2 - Define 0 and Negative Exponents
OB. 3 - Use the Quotient Rule for Exponents
OB. 4 - Use the Power Rules for Exponents
OB. 5 - Simplify Exponential Expressions

## Section 4.2 - Scientific Notation

OB. 1 - Write Numbers in Scientific Notation
OB. 2 - Convert Numbers in Scientific Notation to Standard Notation
OB. 3 - Use Scientific Notation in Calculations
4.3 - Adding and Subtracting Polynomials

OB. 1 - Define and Classify Polynomials
OB. 2 - Add and Subtract Polynomials
Section 4.4 - Polynomial Functions, Graphs, and Composition
OB. 1 - Recognize and Evaluate Polynomial Functions
OB. 3 - Add and Subtract Polynomial Functions
OB. 5 - Find the Composition of Functions
Section 4.5 - Multiplying Polynomials
OB. 1 - Multiply Terms
OB. 2 - Multiply any Two Polynomials
OB. 3 - Multiply Binomials
OB. 4 - Find the Product of a Sum and Difference of Two Terms
OB. 5 - Find the Square of a Binomial
OB. 6 - Multiply Polynomial Functions
Section 4.6 - Dividing Polynomials
OB. 1 - Divide a Polynomial by a Monomial
OB. 2 - Divide a Polynomial by a Polynomial of Two or More Terms
OB. 3 - Divide Polynomial Functions

## Chapter 5

Section 5.1 - Greatest Common Factors and Factoring by Grouping
OB. 1 - Factor out the Greatest Common Factor
OB. 2 - Factor by Grouping

## Section 5.2 - Factoring Trinomials

OB. 1 - Factor Trinomials when the Coefficient of the Second-Degree Term is 1
OB. 2 - Factor Trinomials by Grouping ( $\mathrm{a} \neq 1$ )
OB. 3 - Factor Trinomials using the FOIL method when the Coefficient ( $a \neq 1$ )
OB. 4 - Factor using Substitution

## Section 5.3 - Special Factoring

OB. 1 - Factor a Difference of Squares
OB. 2 - Factor a Perfect Square Trinomial
OB. 3 - Factor a Difference of Cubes* (formula provided)
OB. 4 - Factor a Sum of Cubes* (formula provided)
Section 5.5 - Solving Quadratic Equations Using the Zero-Factor Property
OB. 1 - Use the Zero-Factor Property
OB. 2 - Solve Applied Problems that require the Zero-Factor Property

Chapter 6

## Section 6.1 - Rational Expression and Functions; Multiplying and Dividing

OB. 1 - Define Rational Expression
OB. 2 - Define Rational Functions and give their Domains
OB. 3 - Write Rational Expressions in Lowest Terms
OB. 4 - Multiply Rational Expressions
OB. 5 - Find Reciprocals of Rational Expressions
OB. 6 - Divide Rational Expressions

## Section 6.2 - Adding and Subtracting Rational Expressions

OB. 1 - Add and Subtract Rational Expressions with the same Denominator
OB. 2 - Find a Least Common Denominator
OB. 3 - Add and Subtract Rational Expressions with different Denominators

## Section 6.3 - Complex Fractions

OB. 1 - Simplify Complex Fractions by Simplifying the Numerator and Denominator
OB. 2 - Simplify Complex Fractions by Multiplying by a Common Denominator
OB. 3 - Compare the two methods of Simplifying Complex Fractions
OB. 4 - Simplify Rational Expressions with Negative Exponents
Section 6.4 - Equations with Rational Expressions and Graphs
OB. 1 - Determine the Domain of the Variable in a Rational Equation
OB. 2 - Solve Rational Equations
Section 6.5 - Applications of Rational Expressions
OB. 1 - Find the Value of an Unknown Variable in a Formula
OB. 2 - Solve a Formula for a Specified Variable
OB. 3 - Solve Applications using Proportions
OB. 4 - Solve Applications about Distance, Rate, and Time
OB. 5 - Solve Applications about Work Rates

## Section 6.6 - Variation

OB. 1 - Write an Equation Expression Direct Variation
OB. 2 - Find the Constant of Variation, and Solve Direct Variation Problems
OB. 3 - Solve Inverse Variation Problems
OB. 4 - Solve Joint Variation Problems
OB. 5 - Solve Combined Variation Problems

## Chapter 7

## Section 7.1 - Radical Expressions and Graphs

OB. 1 - Find Roots of Numbers
OB. 2 - Find Principal Roots
OB. 4 - Find nth Roots of Nth Powers
OB. 5 - Use a Calculator to find Roots
Section 7.2 - Rational Exponents
OB. 1 - Use Exponential Notation for nth Roots
OB. 2 - Define and use Expressions of the form am/n
OB. 3 - Convert between Radicals and Rational Exponents
OB. 4 - Use the Rules for Exponents with Rational Exponents

Section 7.3 - Simplifying Radicals, the Distance Formula, and Circles
OB. 1 - Use the Product Rule for Radicals
OB. 2 - Use the Quotient Rule for Radicals
OB. 3 - Simplify Radicals
OB. 4 - Simplify Products and Quotients of Radicals
OB. 5 - Use the Pythagorean Theorem
OB. 6 - Use the Distance Formula
OB. 7 - Find the Equation of a Circle given its Center and Radius (also covered in 12.1)
Section 7.4 - Adding and Subtracting Radical Expressions
OB. 1 - Simplify Radical Expressions involving Addition and Subtraction
Section 7.5 - Multiplying and Dividing Radical Expressions
OB. 1 - Multiply Radical Expressions
OB. 2 - Rationalize Denominators with One Radical Term
OB. 3 - Rationalize Denominators with Binomials involving Radicals
OB. 4 - Write Radical Quotients in Lowest Terms

## Section 7.6 - Solving Equations with Radicals

OB. 1 - Solve Radical Equations using the Power Rule
OB. 2 - Solve Radical Equations that require additional steps (excluding Example 5)
OB. 3 - Solve Radical Equations with indexes greater than 2
OB.4-Use the-Power Rule to-Solve a Formula for a specified Variable

## Section 7.7 - Complex Numbers

OB. 1 - Simplify Numbers of the form $v$ - $b$, where $b>0$
OB. 2 - Identify Subsets of the Complex Numbers

## Chapter 8

## Section 8.1 - The Square Root Property and Completing the Square

OB. 1 - Review the Zero-Factor Property
OB. 2 - Learn the Square Root Property
OB. 3 - Solve Quadratic Equations of the form $(a x+b) 2=c$ by extending the Square Root Property
OB. 4 - Solve Quadratic Equations by Completing the Square
OB. 5 - Solve Quadratic Equations with Nonreal Complex Solutions

## Section 8.2 - The Quadratic Formula

OB. 1 - Derive the Quadratic Formula
OB. 2 - Solve Quadratic Equations using the Quadratic Formula
OB. 3 - Use the Discriminant to Determine Number and Type of Solutions

## Section 8.3 - Equations that Lead to Quadratic Methods

OB. 1 - Solve Rational Equations that lead to Quadratic Equations
OB. 2 Solve Applied Problems involving Quadratic Equations
OB. 3 - Solve Radical Equations that lead to Quadratic Equations
OB. 4 - Solve Equations that are Quadratic in Form* (new)
Section 8.4 - Formulas and Further Applications
OB. 2 - Solve Applied Problems Using the Pythagorean Theorem

## Section 8.5 - Polynomial and Rational Inequalities

OB. 1 - Solve Quadratic Inequalities
OB. 2 - Solve Polynomial Inequalities of Degree 3 or greater
OB. 3 - Solve Rational Inequalities

## Chapter 9

## Section 9.1 - Review of Operation and Composition

OB. 1 - Review Operations of Functions
OB. 2 - Find a Difference Quotient
OB. 3 - Form Composite Functions and find their Domains
Section 9.3 - More About Parabolas and Their Applications
OB. 1 - Find the Vertex of a Vertical Parabola (as in Example 3, do not Complete the Square)
OB. 2 - Graph a Quadratic Function
OB. 3 - Use the Discriminant to Find the Number of $x$-intereepts

## Chapter 10

## Section 10.2 - Exponential Functions

OB.1-Evaluate Exponential Expressions using a Caleulator
OB. 2 - Define and Graph Exponential Functions (excluding Example 4)
OB. 3 - Solve Exponential Equations of the form ax $=a k$ for $x$

## Section 10.3 - Logarithmic Functions

OB. 1 - Define a Logarithm
OB. 2 - Convert between Exponential and Logarithmic forms, and Evaluate Logarithms
OB. 3 - Solve Logarithmic Equations of the form loga $b=k$ for $a, b$, or $k$
OB. 4 - Use the Definition of Logarithm to Simplify Logarithmic Expressions
OB. 5 - Define and Graph Logarithmic Functions

## Section 10.4 - Properties of Logarithms

OB. 1 - Use the Product Rule for Logarithms
OB. 2 - Use the Quotient Rule for Logarithms
OB. 3 - Use the Power Rule for Logarithms
OB. 4 - Use Properties to write alternative forms of Logarithmic Expressions

## Section 10.5 - Common and Natural Logarithms

OB. 1 - Evaluate Common Logarithms using a Calculator
OB. 2 - Use Common Logarithms in Applications
OB. 3 - Evaluate Natural Logarithms using a Calculator
OB. 4 - Use Natural Logarithms in Applications
Section 10.6 - Exponential and Logarithmic Equations; Further Applications
OB. 1 - Solve Equations involving Variables in the Exponents
OB. 2 - Solve Equations involving Logarithms

## Chapter 11

Section 11.4 - Graphs and Applications of Rational Functions
OB. 2 - Find Asymptotes of the Graph of a Rational Function
OB. 3 - Graph Rational Functions (excluding Example 7 \& 8)

## Chapter 12

## Section 12.1 - Circles Revisited and Ellipses

OB. 1 - Graph Circles
OB. 2 - Write an Equation of a Circle given its Center and Radius
OB. 3 - Determine the Center and Radius of a Circle given its Equation

## Section 12.3 - Nonlinear Systems of Equations

OB. 1 - Solve a Nonlinear System using Substitution

OB. 2 - Solve a Nonlinear System with Two Second-Degree Equations using Elimination
OB. 3 - Solve a Nonlinear System that requires a combination of methods
Section 12.4 - Second Degree Inequalities, Systems of Inequalities, and Linear Programming OB. 1 - Graph Second-Degree Inequalities
OB. 2 - Graph the Solution

