MATH 103 – COLLEGE ALGEBRA
4 Credits, CRN: 63283
Asynchronous Online; 8/22 – 12/16

INSTRUCTOR: David William K.W.L. DONLIN, Lecturer, Mathematics
VIRTUAL CLASSROOM: https://meet.google.com/fdu-vdxo-kvz
OFFICE: https://meet.google.com/fdu-vdxo-kvz
OFFICE HOURS: TTh, 5:00 pm – 5:30 pm, 7:20 pm – 8:00 pm or by appointment
EMAIL: donlind@hawaii.edu
EFFECTIVE DATE: Fall 2022

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
Linear equations, inequalities, systems of equations, polynomials, functions, fractional expressions and equations, exponents, powers, roots, quadratic equations and functions; rational, exponential and logarithmic functions.

STUDENT LEARNING OUTCOMES
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

COURSE TASKS
The mode of instruction is primarily discussion-problem solving where the initial portion of each class period may be utilized to discuss and clarify any questions from the preceding class meeting and/or assignment, and the remaining portion is used to discuss new material. Lectures, directed student explorations, group work, appropriate technologies, and projects will also be used as appropriate. After the completion of each unit, a review and exam will be conducted.
The student will demonstrate competency in the objectives by participating in and completing all class activities, by completing and turning in all assignments as requested, by taking unit tests, and by taking a final exam over concepts and skill covered in the entire course. Class activities, unit tests, and the final exam are to be taken in the classroom and without any references unless otherwise stipulated by the instructor.

It is the student’s responsibility to obtain and complete all assignments that are given in any class meeting for which the student is unable to attend. Unless permission is granted by the instructor beforehand, assignments and tests must be completed and submitted to the instructor at the specified date and time.

**Absences**

If you are absent, you are responsible for any important announcements or assignments given during the class you missed. Advanced warning of absences is appreciated, but not required; however, it does help me to help you if you keep me posted. You can also arrange to meet with me during office hours to review any missed lecture material.

**Calculators**

Non-graphing calculators are allowed on exams. A calculator may be used on homework as needed.

**Exams**

*There are no retests or make-ups for exams.* The final exam is cumulative. If you are unable to attend class on an exam day, it may be possible for you to take the exam earlier than the specified day/time. You must contact the instructor ahead of time to arrange this.

* If the percent earned on the final exam is higher than your lowest exam score, then your lowest exam score will be replaced with the percent earned on the final exam.

**Homework**

Homework will be completed online via the MyLab Math program. Keep in mind that homework is not simply a task to be completed but an opportunity to practice at your own pace. You may need to do more than the assigned homework problems to become comfortable with the concepts and skills; you may have to repeat problems to make sure you understand.

**Student Exemplars**

For every section we cover you will select any one of the problems from the MyLab Math homework set in that section and post your solution and response to the prompts on the class Laulima discussion board for at most 3 points per problem. Further details on this assignment will be posted on Laulima as well.

**In-Class Activities**

In-class worksheets will be turned in for credit. These activities are considered class participation points. You may not make up in-class activities.
ASSESSMENT TASKS AND GRADING

Grading
To receive full credit for problems done on exams and in-class activities, you must show sufficient work in a clear and organized manner to display your understanding of the content. Messy and/or disorganized work will not receive full credit.

Points will be assigned to each graded assignment, class activity, and tests as follows:

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Points</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 Exams (100 Points Each)</td>
<td>300</td>
<td>60%</td>
</tr>
<tr>
<td>Final Exam</td>
<td>120</td>
<td>15.0%</td>
</tr>
<tr>
<td>Student Exemplars</td>
<td>99</td>
<td>12.5%</td>
</tr>
<tr>
<td>MyLab Math</td>
<td>100</td>
<td>12.5%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
<td></td>
</tr>
</tbody>
</table>

Course Grade
A letter grade for the course will be assigned according to the level of achievement as provided in the table below:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>90% – 100% of the cumulative points possible</td>
</tr>
<tr>
<td>B</td>
<td>80% – 89% of the cumulative points possible</td>
</tr>
<tr>
<td>C</td>
<td>70% – 79% of the cumulative points possible</td>
</tr>
<tr>
<td>D</td>
<td>60% – 69% of the cumulative points possible</td>
</tr>
<tr>
<td>F</td>
<td>less than 60% of the cumulative points possible.</td>
</tr>
<tr>
<td>N</td>
<td>definition listed below</td>
</tr>
<tr>
<td>Cr</td>
<td>70% – 100% of the cumulative points possible</td>
</tr>
<tr>
<td>NC</td>
<td>less than 70% of the cumulative points possible</td>
</tr>
</tbody>
</table>

Note: CR/NC grades require written instructor consent. Students must apply for CR/NC grading option at the Admissions Office by the posted deadline. If a student does not apply for CR/NC grading option at the Admissions Office by the required deadline and if s/he does not withdraw, a letter grade (A, B, C, D, F, N) will be assigned for the course.

Note: The W grade is given only when the student officially withdraws from the course by the posted deadline. If a student withdraws from this course they must also withdraw from the companion Math 88 course.

Note: The I grade is a temporary grade given at the instructor’s option when a student has failed to complete a small part of a course because of circumstances beyond his or her control. A student may qualify for the “I” grade if: (a) they are unable to take the final exam and (b) taking the final exam could possibly raise their course grade. The “I” grade is given by student request and must be approved by the instructor.

Note: The N grade is given at the discretion of the instructor and only when the criteria for the N grade is met by the student. Consult the WCC Catalog for the criteria of the N grade.
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Note: Students must apply for the Cr/NC grading option at the Admissions Office. Consult the WCC Catalog for deadlines.

Note: W grade is given only when the student officially withdraws from the course at the Admissions Office. Consult the WCC Catalog for deadlines.

**LEARNING RESOURCES**

**Pearson – MyLab Math:**
- Pearson can be accessed through the link on the Laulima page for this class.
- [https://www.pearson.com/mylab](https://www.pearson.com/mylab)

**Google Classroom:**
- Access through your UH Gmail account with Class Code: wbt3bss

**Laulima:**
- “College Algebra” tab when logged into Laulima

**Learning Resources**
  - Access to Pearson, MyLab Math will provide you with a digital version of the textbook. The physical textbook is not necessary for this class.
- **Tutor.com:** [https://windward.hawaii.edu/tutor.com/](https://windward.hawaii.edu/tutor.com/)
- **OLA (UH online tutoring program):** [http://manoa.hawaii.edu/ola/](http://manoa.hawaii.edu/ola/)
- **Khan Academy Videos:** [http://www.khanacademy.org](http://www.khanacademy.org)
- **Desmos online graphing calculator:** [https://www.desmos.com/calculator](https://www.desmos.com/calculator)
- **Google Search** – but go to “Images” then “Videos”, reading is dumb

**Ka Piko Services** provides FREE academic and technical support to all WCC students. Our services are available both in-person and virtually (via Zoom). Our goals are to help students succeed academically and to become independent lifelong learners. We are staffed by friendly and knowledgeable peers who are ready to assist you!

- **Ka Piko Math Lab** provides assistance for all math courses offered at WCC, helping to improve students’ understanding of important concepts and problem-solving processes.
- **Ka Piko Writing Lab** provides assistance with any and all aspects of the writing process, including: brainstorming, research, MLA formatting and citations, drafting, and revising.
- **Ka Piko Student Tech. Support** can assist students with Google@UH, Laulima, MyUH, UH accounts, and can provide best-effort support for problems or questions with personal computers and other smart devices.
- **Ka Piko also provides free weekly Success Connection Workshops** for students

Visit the Ka Piko webpage at [go.hawaii.edu/A42](go.hawaii.edu/A42) for more information about our services, to learn how to connect with our tutors and tech assistants, or to RSVP for a Success Connection Workshop.
Workshop. Contact the Ka Piko Coordinator, Scott Sutherland, at scottjks@hawaii.edu if you have any questions.

**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) 235-7448, 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:

- Karen Cho  
  Deputy Title IX Coordinator  
  Phone: 808-235-7404  
  Email: kcho@hawaii.edu

- Desrae Kahale *Confidential Resource*  
  Phone: 808-235-7393  
  Email: dkahale3@hawaii.edu

- Jojo Miller, *Confidential Campus Advocate*  
  Phone: 808-348-0663  
  Email: jojo.miller@hawaii.edu

- Leslie Cabingabang *Senior Confidential Advocate*  
  Phone: 808-348-0432  
  Email: leslie.cabingabang@hawaii.edu

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/
ACADEMIC INTEGRITY

Work submitted by a student must be the student’s own work. In this class, students who commit academic dishonesty, cheating or plagiarism will have the following consequence(s):

Students will receive a failing grade for plagiarized assignments.

All cases of academic dishonesty are referred to the Vice Chancellor for Student Affairs.

Academic Honesty

All exams must be done by your own individual effort. You may not consult with any classmates while taking exams. This would fall under the guidelines of academic integrity and any evidence of cheating will result in a score of 0 for all parties involved. An “F” will be assigned to students involved in cheating and will be reported to the Dean. See http://windward.hawaii.edu/Policies/ for more information on the UH system-wide student conduct code.

ALTERNATE CONTACT INFORMATION

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:

- Location: Alaka‘i 121
- Phone: (808) 235-7422

COURSE CONTENT

DONLIN – Fall 2022; TTh 5:30 – 7:20 PM (CRN: 63283)
Academic Calendar: https://windward.hawaii.edu/campus-life/events-calendar/academic-calendar/
August 21 – Last Day of Regular Registration
August 30 – Last Day to Add/Late Register, Last Day for 100% Refund
September 13 – Last Day for 50% Refund, Last Day to Withdraw without a “W” Grade
October 31 – Last Day to Establish C/NC and Audit Options, Last Day to Withdraw with a “W”
November 14 – First Day of Registration, Spring 2023
December 8 – Last Day of Instruction
December 16 – Last Day of the Semester
Holidays for the Semester
September 5 (Monday) – Labor Day
November 8 – Election Day (No Classes)
November 11 (Friday) – Veteran’s Day
November 24 – Thanksgiving

*Note that the schedule below is subject to change. Students will be notified of any changes.
<table>
<thead>
<tr>
<th>Date</th>
<th>Class</th>
<th>Homework for the Week</th>
</tr>
</thead>
<tbody>
<tr>
<td>8/23</td>
<td>Syllabus, R.2 – Basic Concepts from Algebra</td>
<td></td>
</tr>
</tbody>
</table>
| 8/25  | R.4 – Exponents, Roots, and Order of Operations  
1.1 – Linear Equations in One Variable  
1.5 – Linear Inequalities in One Variable | R.2, R.4  
1.1, 1.5 |
| 8/30  | 1.6 – Set Operations and Compound Inequalities  
1.7 – Absolute Value Equations and Inequalities |                                     |
| 9/1   | 2.1 – Linear Equations in Two Variables  
2.2 – The Slope of a Line | 1.6, 1.7  
2.1, 2.2 |
| 9/6   | 2.3 – Writing Equations of Lines  
2.4 – Linear Inequalities in Two Variables |                                     |
| 9/8   | 2.5 – Introduction to Relations and Functions  
2.6 – Function Notation and Linear Functions | 2.3, 2.4, 2.5, 2.6 |
| 9/13  | 3.1 – Systems of Linear Equations in Two Variables  
3.2 – System of Linear Equations in Three Variables  
3.3 – Applications of Systems of Linear Equations |                                     |
| 9/15  | 3.3 – Applications of Systems of Linear Equations  
4.1 – Integer Exponents | 3.1, 3.2, 3.3  
4.1 |
| 9/20  | 4.2 – Scientific Notation  
4.3 – Adding and Subtracting Polynomials  
4.4 – Polynomial Functions, Graphs, and Composition |                                     |
| 9/22  | 4.5 – Multiplying Polynomials  
4.6 – Dividing Polynomials | 4.2, 4.3, 4.4, 4.5, 4.6 |
| 9/27  | Exam 1 Review |                                     |
| 9/29  | Exam 1 – Chapters R, 1, 2, 3, 4 |                                     |
| 10/4  | 5.1 – Greatest Common Factors and Factoring by Grouping  
5.2 – Factoring Trinomials  
5.3 – Special Factoring |                                     |
| 10/6  | 5.5 – Solving Quadratic Equations Using the Zero-Factor Property  
6.1 – Rational Expression and Functions; Multiplying and Dividing  
6.2 – Adding and Subtracting Rational Expressions | 5.1, 5.2, 5.3, 5.5  
6.1, 6.2 |
| 10/11 | 6.3 – Complex Fractions  
6.4 – Equations with Rational Expressions and Graphs  
6.5 – Applications of Rational Expressions |                                     |
| 10/13 | 6.6 – Variation  
7.1 – Radical Expressions and Graphs  
7.2 – Rational Exponents  
7.3 – Simplifying Radicals, the Distance Formula, and Circles | 6.3, 6.4, 6.5, 6.6  
7.1, 7.2, 7.3 |
| 10/18 | 7.4 – Adding and Subtracting Radical Expressions  
7.5 – Multiplying and Dividing Radical Expressions |                                     |

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<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
<th>Sections</th>
</tr>
</thead>
<tbody>
<tr>
<td>10/20</td>
<td>7.6 – Solving Equations with Radicals</td>
<td>7.4, 7.5, 7.6, 7.7, 8.1, 8.2</td>
</tr>
<tr>
<td>10/20</td>
<td>7.7 – Complex Numbers</td>
<td></td>
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<tr>
<td>10/25</td>
<td>8.1 – The Square Root Property and Completing the Square</td>
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<tr>
<td>10/25</td>
<td>8.2 – The Quadratic Formula</td>
<td></td>
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<tr>
<td>10/25</td>
<td>8.3 – Equations that Lead to Quadratic Methods</td>
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<tr>
<td>10/25</td>
<td>8.4 – Formulas and Further Applications</td>
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<tr>
<td>10/25</td>
<td>8.5 – Polynomial and Rational Inequalities</td>
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</tr>
<tr>
<td>10/27</td>
<td>Exam 2 Review</td>
<td>8.3, 8.4, 8.5</td>
</tr>
<tr>
<td>11/1</td>
<td>Exam 2 – Chapter 5, 6, 7, 8</td>
<td></td>
</tr>
<tr>
<td>11/3</td>
<td>9.1 – Review of Operation and Composition</td>
<td>9.1, 9.3, 10.2</td>
</tr>
<tr>
<td>11/3</td>
<td>9.3 – More About Parabolas and Their Applications</td>
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<tr>
<td>11/3</td>
<td>10.2 – Exponential Functions</td>
<td></td>
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<tr>
<td>11/8</td>
<td>Election Day (No Classes)</td>
<td></td>
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<tr>
<td>11/10</td>
<td>10.3 – Logarithmic Functions</td>
<td>10.3, 10.4, 10.5</td>
</tr>
<tr>
<td>11/10</td>
<td>10.4 – Properties of Logarithms</td>
<td></td>
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<tr>
<td>11/10</td>
<td>10.5 – Common and Natural Logarithms</td>
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<tr>
<td>11/15</td>
<td>10.6 – Exponential and Logarithmic Equations; Further Applications</td>
<td></td>
</tr>
<tr>
<td>11/15</td>
<td>11.4 – Graphs and Applications of Rational Functions</td>
<td></td>
</tr>
<tr>
<td>11/17</td>
<td>12.1 – Circles Revisited and Ellipses</td>
<td>10.6, 11.4, 12.1, 12.3</td>
</tr>
<tr>
<td>11/17</td>
<td>12.3 – Nonlinear Systems of Equations</td>
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</tr>
<tr>
<td>11/22</td>
<td>12.4 – Second Degree Inequalities, Systems of Inequalities, and Linear Programming</td>
<td></td>
</tr>
<tr>
<td>11/24</td>
<td>Thanksgiving Day (No Classes)</td>
<td>12.4</td>
</tr>
<tr>
<td>11/29</td>
<td>Exam 3 Review</td>
<td></td>
</tr>
<tr>
<td>12/1</td>
<td>Exam 3 – Chapters 9, 10, 11, &amp; 12</td>
<td></td>
</tr>
<tr>
<td>12/6</td>
<td>Final Exam Review</td>
<td>Use this time to catch up on</td>
</tr>
<tr>
<td>12/8</td>
<td>Final Exam Review</td>
<td>Homework and Exemplars</td>
</tr>
<tr>
<td>12/13</td>
<td>No Scheduled Class (Final Exams Week) – Optional Final Exam Review</td>
<td></td>
</tr>
<tr>
<td>12/15</td>
<td>Final Exam: 5:30 pm – 7:30 pm</td>
<td>Final Due Date for Homework and Exemplars: 12/17 @ 6:00 pm</td>
</tr>
</tbody>
</table>

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Chapter R

Section R.2 Basic Concepts from Algebra
OB.1 – Write Sets using Set Notation
OB.2 – Use Number Lines
OB.3 – Classify Numbers
OB.4 – Find Additive Inverses
OB.5 – Use Absolute Value
OB.6 – Use Inequality Symbols

Section R.4 Exponents, Roots, and Order of Operations
OB.1 – Add Real Numbers
OB.2 – Subtract Real Numbers
OB.3 – Use the rules for Order of Operations
OB.4 – Multiply Real Numbers
OB.5 – Find Reciprocals and Divide Real Numbers

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
OB.5 – Solve Applied Problems Using Linear Inequalities

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 \textbf{and}
OB.4 – Find the Union of Two Sets
OB.5 – Solve Compound Inequalities with the word \textbf{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 $|ax + b| = k$, for $k > 0$
OB.3 – Solve Inequalities of the form $|ax + b| < k$ and of the form $|ax + b| > k$, for $k > 0$
OB.4 – Solve Absolute Value Equations that involve rewriting
OB.5 – Solve Equations of the form $|ax + b| = |cx + 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) in which some of the Equations have missing Terms
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

Section 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 when the Coefficient of the Second-Degree Term is not 1
OB.3 – Factor Trinomials using the FOIL method when the Coefficient of the Second-Degree Term is not 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
OB.3 – Solve a Formula for a specified Variable, where Factoring is necessary

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 $a^{m/n}$
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 $-b$, 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 $(ax + b)^2 = c$ 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-intercepts

Chapter 10
Section 10.2 – Exponential Functions
OB.1 – Evaluate Exponential Expressions using a Calculator
OB.2 – Define and Graph Exponential Functions (excluding Example 4)
OB.3 – Solve Exponential Equations of the form $a^x = a^y$ 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 $\log_b a = k$ 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 Set of a System of Inequalities (excluding Example 7)

ADDITIONAL INFORMATION

For those of you new to a synchronous course, there are some things to keep in mind when it comes to a virtual classroom meeting. Be acutely aware of your microphone and camera (i.e. know if it's turned off or on at all times). For our online class I will be recording the class to make the video available for students who want to use it for reference later, but the recording will be focused on the presenter's screen and the speaker, so mostly just me unless you use your microphone during the class. I'm also going to ask, if you're comfortable with it, that you keep your camera on during lessons because it really does help me to be able to see live students during the class. Being able to see actual students helps to recreate some of the advantages of a face-to-face class where I can quickly gauge understanding and notice if you raise your hand to ask questions. However, I will understand if this is more than you're comfortable with and keeping your camera off will not affect you negatively, questions can always be relayed through the chat window as well.

For those of you nervous about distance learning or feeling anxious about taking math online, treating the online class as though it were meeting face-to-face will help get you in the proper mindset. Try to find a place away from distractions if possible and prep for class as if you were actually physically leaving your house to get to class; shower, brush your teeth, change into something appropriate, whatever routine it takes to get you in the right frame of mind.

Disruptive Behavior

Do not be disruptive. Please respect your fellow students and act accordingly.
ADVICE FROM FORMER STUDENTS

At the end of every semester I ask my students the following question: What advice would you give to a student taking this course next semester? Below are their collected response from the past few years.

- Be prepared to do a lot of work.
- Be prepared to manage your time.
- Just do your part and keep doing your homework.
- Focus in class and pay attention.
- Do the Pearson homework and exam reviews. You can learn from attending the online class, but without the practice to solidify what you’ve learned, you will not do well in this class.
- You should spend extra time trying to do practice problems to learn how to do this math.
- GO TO THE ONLINE CLASSES!!! Being in person online is easy and there is a lot of good information and discussion to be had. Don't miss out!
- Complete all the homework. Take your time, get help!
- Don't slack off it's hard to catch up. Keep up with the assignments, there are a lot of them so if you miss any it takes a long time to catch up.
- Try your best not to miss class, or else you will be lost!
- Be ready to pay attention and learn.
- Ask questions.
- Come early to class and ask questions one on one.
- Don't be afraid to ask questions.
- Don't be afraid to ask stupid questions, they aren’t stupid questions if they help you learn.
- Ask the stupid questions! The other students won’t laugh. Do the homework, you’re going to need it on your tests.
- Do the homework to get the best preparation for the tests and understand the concepts.
- Pace yourself with the homework.
- Stay caught up with the homework.
- Do the fricken homework, or else you won’t be ready for the test!
- Stay on track with the syllabus and complete what is due every week.
- Do not procrastinate and stay caught up on the homework, because once you’re behind it’s really hard to catch back up.
- Stay on a rigorous schedule and keep up with assignments. I would also advise that you seek out a tutor before the semester begins and to go over notes with a tutor weekly. Ask for assistance, keep the instructor in the loop, and keep an open line of communication.
- Don’t take this course lightly! Make this your priority! GET YOUR TUTOR ASAP! Go to TRIO go to the math lab! Mr. Donlin is super accommodating and easy to work with BUT YOU STILL HAVE TO KNOW THE CONTENT! If you think you gonna just half @$ it DON’T BOTHER WASTING YOUR TIME OR MONEY/SCHOLARSHIP!!! Be ready to put in work!!!
“I didn’t get there by wishing for it or hoping for it, but by working for it.”

– Estée Lauder

Math is a difficult subject for many people because of the way the content stacks upon itself. For example, I cannot raise a number to a given exponent if I don't know how to multiply, I cannot multiply numbers if I don't know how to add them, and I cannot add if I don't know how to count. Every skill in math sits on a step, below that step are all the stairs of things previously learned to reach that step while above that step are the things yet to learn. Unfortunately, just like in real life, walking the stairs kinda sucks; most people would rather ride the escalator or risk the germs incubating in the elevator or, if you're like me, it would be awesome if there were someone there to just wheel you around while you sat in a comfy chair. But again, just like in real life, you'll be forced to take the stairs because machines break down and as my mother tells me, "no one is pushing your lazy ass around." Mother's love aside, I previously mentioned that math is a learned skill and as a learned skill it has much in common with playing just about any sport. Take the "Big Game" for example. How does one prepare for this event? I would assume that there would be weeks, if not months, of conditioning, training, and strategizing to maximize performance and provide the best opportunity to "take the win" as the saying goes (I'm assuming all this because I've never played "the sports" myself, I was an indoor recess kind of kid). So tying this back to math, students in a math class can expect to practice their math skills outside of class, i.e. homework. Unfortunately, the term “homework” comes with a number of negative connotations learned from way back in grade school when a task was assigned by the teacher and your primary goal was to complete such a task so you could be done with it all because you felt that you had better things to do with your time. Learning does not simply materialize from completing one task after another; rather the labor of the task is meant to hone your senses in a particular fashion and makes you stronger for having done the work. You have chosen an academic path that will push you to determine what it means for you to be successful. You need to determine how much time to put into your course work, honestly figure out when you need to practice more or have had enough, and, most importantly, when to reach out for help. Thus, onto the scene, enters me, your instructor. Consider me to be the Yoda to your Luke Skywalker or the Mr. Miyagi to your Daniel-san. During class there is a great deal of content to cover and I can help set you up and show you the basics of how to approach each problem, but your understanding will be developed and solidified as you practice on your own, exercise your force powers, wax-on/wax-off, take the stairs if you will. I believe that just about anyone can learn the math I teach, but I also recognize the struggle of learning everything in only 15 weeks while also balancing work, family, and all manner of other responsibilities; this is the truly challenging part for most students. However, walking away with a win doesn't always come easy, just ask Luke Skywalker and Daniel-san, you can find them taking the stairs.
For my first wax on/wax off moment, I want you to keep two things in mind, as far as math is concerned, that are illustrated in the pictures below and on the following page:

1. The language and symbology of mathematics is exact. This is not an art class, and the positioning of numbers, letters, and the lines between them all have a purpose.
2. Much of the solution to a math problem is implied by the smallest of details and it will be up to you to bring the knowledge needed to solve these problems. This is very much unlike, for instance, an essay question, where you can sometimes extract part of your answer from the question or the way it is framed.

“__”

What does this symbol represent?

\[-8 - \left( \frac{9}{5} \right)^{-3} = 42\]
How do you solve the following problem?

Find the Volume of the Prism.

\[ V = Bh \]

There is a Right Triangle here and Pythagorean Theorem can be applied.
Leg 1 = 48 in.
Leg 2 = unknown
Hypotenuse = 60 in.

Height of the Triangle, but not Height of the Prism.

Prism is a Triangular Prism and the Base of the Prism is a Triangle.

Find the Volume of the Prism.

\[ h = \text{Height of the Prism} \ (\text{this is different from the Height of the Triangle}) \]

B = the Area of the Base (The Base is a Triangle, so the Area Formula for a Triangle is needed: \( A = \frac{bh}{2} \) where ‘\( b \)’ is the Base of the Triangle and ‘\( h \)’ is the Height of the Triangle.)

Units here are in ‘feet’ but other measurements are in ‘inches’. All measurements need to be converted to the same Units of Measure, either feet or inches.

This is the Length of the Base of the Triangle and is needed to calculate the Area of the Base of the Prism.

Pythagorean Theorem \( (a^2 + b^2 = c^2) \), solve for ‘a’ or ‘b’) must be used to find this length, then multiply that value by 2 in order to find the Length of the Base of the Triangle.