MANDATORY ORIENTATION MEETING

All students enrolled in Math 108 for the Summer 2020 semester must attend the Live Zoom Orientation Meeting. All Orientation Zoom Meeting instructions will be emailed to your university email. Please check your university email and follow the directions that were sent to you.

Any student who does not attend an orientation meeting will be automatically dropped from the course.
How to Get Started in MATH 108

How To Get Started…

☐ 1. Attend the Zoom Orientation Meeting. (Check your university email for instructions.) Students who do not attend the orientation meeting will be dropped from the course.

☐ 2. Register for MyLabsPlus and complete the orientation homework.
   - Go to uidaho.mylabsplus.com (will redirect to https://uidaho-mlpui.openclass.com)
   - Your username will be your University of Idaho email address.
   - Your password will be assigned and emailed to you.
   - Enter your access code when prompted.

Students who fail to register for MyLabsPlus and complete the orientation homework within 24 hours of the Zoom orientation meeting will be automatically dropped from the course.

☐ 3. Get started on your first homework assignment by reading the eText, filling out every page of the notebook, and completing all homework exercises in MyLabsPlus.

☐ 4. Complete a proctor information form found on the next page of your course notebook. **You must find a university approved proctor and complete the proctor information form and email it to your instructor by 5:00 PM Pacific time on June 19, 2020.**
PROCTOR INFORMATION FORM, SUMMER 2020 POLYA CLASSES

STUDENT INFORMATION (Please print.)

Student Name (first and last): __________________________________________

Student Signature: _____________________________________________________

Student Vnumber: ______________________________________________________

Vandalmail: ____________________________________________________________

Summer Address
Street (or PO Box): ____________________________________________________
City: ____________________
State: ___________ Zip: ___________ Country: ____________________

PROCTOR INFORMATION (Please print.)
Select a proctor from the NCTA: https://www.ncta-testing.org/about-cctc

Testing Center Name: ____________________________________________________

Location: ______________________________________________________________

Website: ______________________________________________________________

Contact Name at Testing Center: _________________________________________

Email: ________________________________________________________________

Phone number: _________________________________________________________

All proctored exams must be administered at a testing center certified by the NCTA.
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Quiz 1
Proctor Information Forms Due
Sections 2.3 & 2.4 HW Due
Section 2.5 HW Due
Test 1
Sections 3.1, 3.3 & 4.1 HW Due
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<td>Test 4</td>
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MATH 108
INTERMEDIATE ALGEBRA

Course Syllabus

SUMMER 2020

1. GOALS OF THE COURSE: The primary purpose of Intermediate Algebra is to improve your skills and competency in algebra so that you will be successful in College Algebra, the other math courses required for your major, and in the courses that use mathematics. Another goal is to help you develop your mathematical learning skills so that you will be more confident in future mathematical courses.

2. LEARNING OUTCOMES: After completing Math 108, the student should be able to:
   - Solve linear equations in one variable, radical equations, absolute value equations, rational equations, and quadratic equations
   - Graph linear equations and linear functions
   - Solve systems of two linear equations and solve word problems using a system of linear equations
   - Factor polynomial expressions
   - Use the properties of exponents (including rational exponents) to simplify exponential expressions
   - Simplify, add, subtract, multiply, and divide rational expressions and simplify complex fractions
   - Add, subtract, multiply, and divide complex numbers

3. REQUIRED STUDENT MATERIALS

This is an online course. Every student must have a working computer, webcam, and a fast internet connection. All students must have access to a university approved testing center as all tests will be proctored at an approved testing center. All costs associated with testing will be incurred by the student. For more details, see the section in the syllabus under TEST PROCEDURES.

MATH 108 SUMMER 2020 COURSE NOTEBOOK: Must be purchased at the U of I Bookstore. Students will be required to bring this course notebook to class and to all zoom tutoring sessions to receive help.

MyLabsPlus Access Code: All students must purchase a Math 108 access code in the UI Bookstore OR purchase it online. Your instructor will email you directions as to how to purchase the code online and will also show you how to purchase a code online during the zoom orientation. If you have purchased the code at the UI bookstore, please have your code with you when you attend the zoom orientation meeting. Students who do not attend the zoom orientation meeting will be dropped from the course.

To use your Access Code, you must do the following:
1. Go to https://uidaho-mlpui.openclass.com
2. Sign in. Your username is your U of I email address; e.g., jovevandal@vandals.uidaho.edu. Your password will be given to you by your instructor. You are then encouraged to change your password.
3. Click on your course
4. Accept the license agreement, and then enter your Access Code that you purchased at the bookstore, or click “buy now” and use your credit card, or use the temporary access code.

5. You should now be ready to start the course.

HEADPHONES: Headphones are needed to listen to the video lectures at the computers.

REQUIRED CALCULATOR TI 30xIIS.: You will need a calculator to work on some problems from the assignments, quizzes and/or tests. The TI 30-X IIS calculator is THE ONLY CALCULATOR allowed when testing. You must have your own calculator.

4. GRADE CALCULATION

Your course instructor will send you a detailed description about how the Summer 2020 grades will be calculated. Your instructor will also explain how your grades will be calculated during the mandatory Zoom orientation meeting at the beginning of the summer session.

5. THE STUDENT WITH SPECIAL NEEDS

We are committed to accommodate students with special needs. Reasonable accommodations are available for students who have documented temporary or permanent disabilities. All accommodations must be approved through the Center for Disability and Resources located in the Pitman Center, Suite 127 in order to notify your instructor(s) as soon as possible regarding accommodation(s) needed for the course.

   • (208) 885-6307
   • email at cdar@uidaho.edu
   • website at www.uidaho.edu/current-student/cdar

6. TEST PROCEDURES

   • All tests are password protected and will be proctored at a university approved proctoring facility. To see a list of university approved proctoring facilities in your area go to https://www.ncta-testing.org/about-ctc.
   • Students are responsible for finding a qualified person to supervise and proctor exams. Students and their qualified proctor must compete the proctor information form found at the front of this course notebook. This form must be completed and received by the course instructor via email by 5:00 PM Pacific Time on June 19, 2020. If you need to change proctors for any reason, you must first obtain instructor permission and fill out a new proctor information form and have it approved by your instructor no later than one week prior to the next scheduled test deadline date.
   • It is the students’ responsibility to schedule all tests with the proctoring facility and to adhere to all testing deadlines. All costs associated with test proctoring are the responsibility of the student. If you do not have access to an approved proctoring facility in your area, or do not have adequate monetary resources, then you should NOT take an online course.
   • The student must show a government issued picture identification to the proctor before taking an exam (Student ID cards are NOT acceptable)
• Tests can be taken anytime that you feel you are ready. Tests CANNOT be taken after the
deadline. The deadline for each test is outlined below:

<table>
<thead>
<tr>
<th>Test</th>
<th>Deadline</th>
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<tbody>
<tr>
<td>Test 1</td>
<td>June 26 by 5:00 PM</td>
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<td>Test 2</td>
<td>July 10 by 5:00 PM</td>
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<td>Test 3</td>
<td>July 24 by 5:00 PM</td>
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<td>Test 4</td>
<td>August 7 by 5:00 PM</td>
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</table>

• It is strongly recommended that each student schedule tests as soon as possible.
• Only a TI30xII scientific calculator is allowed during tests.
• NO NOTES of any kind are allowed during tests.
• NO DEVICES which are capable of transmitting or receiving data, including but not limited to
  watches, phones, tablets, iPods, and calculators, may be on your person during the exam. Any
  such items are expected to be left at home or in a secured place outside of the testing area.
  Failure to do so will result in a zero on the exam and possibly a failing grade for the course.
• Students must earn at least a 60% on the corresponding practice test before the first
  version of the test will become available.
• After each test, students will have the opportunity to earn back up to 25% of each missed test
  question by completing an exam correction form for each missed question. Exam corrections
  must be scanned and sent to your instructor via email and must be received no later than 5:00
  PM on the day listed below. The deadlines for submitting exam correction forms are outlined
  below:

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<th>Test</th>
<th>Deadline</th>
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<td>Test 1</td>
<td>Correction forms must be received by your instructor by 5:00 PM on June 27</td>
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<tr>
<td>Test 2</td>
<td>Correction forms must be received by your instructor by 5:00 PM on July 11</td>
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<tr>
<td>Test 3</td>
<td>Correction forms must be received by your instructor by 5:00 PM on July 25</td>
</tr>
<tr>
<td>Test 4</td>
<td>Correction forms must be received by your instructor by 5:00 PM on August 7</td>
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• A blank exam correction form and a sample can be seen at the end of this course syllabus.
  Please make multiple copies of the blank exam correction form.

7. COMMUNICATIONS AND EMAIL

Announcements about the course, special sessions, changes in schedules or procedures, and so forth, will
be sent to your university e-mail account. You are expected to check your University e-mail regularly.
Every student must attend a mandatory orientation session at a time announced via email which
will be sent to your university email account.

All emails must be sent to your instructor using your UNIVERSITY OF IDAHO email account.
Emails sent using any other email account will not be read.

All emails must follow standard grammar and punctuation rules. Any email which fails to adhere to
these standards will be returned to you for revision. Emails should also follow basic email etiquette.
Any emails that violate the student code of conduct regarding respect of others will be sent to the Dean of
Students as appropriate.

8. ACADEMIC HONESTY

Students are expected to maintain Academic Honesty in all their work. Collaboration is encouraged on
homework assignments. All tests are considered individual work and must be completed without
unauthorized assistance of any kind, including the help of other students, tutors, notes, or unauthorized calculators. All scratch paper from tests are to be collected, scanned, and emailed to your instructor on the day that tests are administered.

The University of Idaho has defined acceptable behavior in the Student Code of Conduct Article II.A-1 – Academic Dishonesty [rev. 7-98, 7-05, 7-14, ed. 7-09]. The following summarizes relevant points related to your math course:

- **Because academic honesty and integrity are core values at a university, the faculty finds that even one incident of academic dishonesty may merit expulsion.**
- **Cheating tests is a violation of this code.**
- Plagiarism, falsification of academic records, falsification of records and the acquisition or use of test materials without faculty authorization are considered forms of academic dishonesty and, as such, are violations of this code.
- Instructors and students are responsible for maintaining academic standards and integrity in their classes. Consequences for academic dishonesty may be imposed by the course instructor. Such consequences may include but cannot exceed a grade of "F" in the course.

(The full text of the Student Code of Conduct may be found at [https://www.uidaho.edu/student-affairs/dean-of-students/student-conduct](https://www.uidaho.edu/student-affairs/dean-of-students/student-conduct))

9. **ASSIGNMENT/TEST EXTENSIONS**

- The due dates for all homework, quizzes, and the tests are stated in this notebook. These due dates will not change and there will be NO EXTENSIONS except for reasons recognized by the University.
- Make up work for assignments will not be allowed unless a previous arrangement with the instructor is made prior to the assignment due date or in cases of medical or family emergency, in which case documentation of the emergency will be required. Documentation must be **provided within two business days** of the assignment’s due date, not to exceed the last day for taking Test 4. Email appropriate documentation to your instructor.
- If an extension is granted, the length of the extension will be determined by the number of days listed on the documentation.

10. **Summary of Expectations for Student Performance**

- Attend the mandatory zoom orientation with your instructor
- Purchase Math 108 Summer 2020 Course Notebook
- Purchase a MyLabsPlus Access code and register for software by the first day of class
- Complete the orientation quiz in MyLabsPlus
- Find a university approved test proctoring site and email a Proctor Information Form to your instructor by June 19, 2020
- Fill out every page of the course notebook and complete homework and quizzes as outlined in the course calendar
- Check your University of Idaho email at least one time every day
• Be on time and prepared for every zoom class meeting and pay attention for the entire zoom class period
• Have your course notebooks available during zoom class meetings with appropriate pages completed for the day
• Take tests at a university approved proctoring site. You must bring a copy of the test cover sheet with you to the proctoring site. The test cover sheet and all scratch paper will be scanned and emailed to the course instructor by 5:00 PM Pacific Time on the test deadline day
• Maintain Academic Honesty in all my work

11. Summary of Expectations for Instructor

• Be on time and prepared for each zoom class
• Be prepared to present upcoming material and answer student questions
• Respond to emails during business hours (Note: It may take more than one day to research and respond to an email. I will check my email at least once during each business day.)
• Establish zoom office hours
• Be available during designated zoom office hours
Fill out the form below to earn back partial credit (up to 25% of the worth of the question) for missed exam question. Send a photo (.jpg) or scan (.pdf at 300 dpi resolution) to your teacher by 5 PM PDT on the day AFTER the test deadline day for the question to be considered for partial credit.

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<th>Copy down the exact question here. (Not required for word problems.)</th>
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<td>Work through the problem here, showing all work for all steps.</td>
<td>Write your steps to the problem in English. (Make yourself a set of directions.)</td>
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<td>Explain your mistake.</td>
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</tr>
<tr>
<td>To avoid this mistake in the future I will:</td>
<td></td>
</tr>
</tbody>
</table>
Fill out the form below to earn back partial credit (up to 25% of the worth of the question) for missed exam question. Send a photo (.jpg) or scan (.pdf at 300 dpi resolution) to your teacher by 5 PM PDT on the day AFTER the test deadline day for the question to be considered for partial credit.

<table>
<thead>
<tr>
<th>Solve: [ \frac{1}{3}y - \frac{1}{4}(y-1) = 2y ]</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Name</strong> Sample Math 108 (first and last)</td>
</tr>
<tr>
<td><strong>Exam</strong> (1) (2) (3) (4) <strong>Question number</strong> (circle exam number, fill in question number) 5</td>
</tr>
</tbody>
</table>

Work through the problem here, showing all work for all steps.

\[ \frac{1}{3}y - \frac{1}{4}(y-1) = 2y \]

1. **LCD**: 12

2. \[(12) \frac{1}{3}y - (12) \frac{1}{4}(y-1) = 2y(12)\]

3. \[4y - 3(y-1) = 24y\]

4. \[4y - 3y + 3 = 24y\]

\[y + 3 = 24y\]

\[-y\]

\[\frac{3}{23} = \frac{23y}{23}\]

\[y = \frac{3}{23}\]

**Write your steps to the problem in English.** (Make yourself a set of directions.)

1. Determine the LCD.

2. Multiply each term by the LCD.

3. Simplify the equation so that there are NO more fractions.

4. Solve for the variable and write the answer as a simplified fraction.

**Explain your mistake.**

I forgot to multiply each term by the LCD.

**To avoid this mistake in the future I will:**

I will carefully find the LCD and then carefully multiply each term by the LCD.
Section 1.1 Task List

Work through each of the following tasks, carefully filling in the following pages in your notebook.

Section 1.1 Linear Equations in One Variable
- Work through Objective 1 then do problems #1-4
- Work through Objective 2 then do problems #5-15
- Work through Objective 4 then do problems #16-24
Section 1.1 Linear Equations in One Variable

Section 1.1 Objective 1: Determine if a Given Value Is a Solution to an Equation

What is an algebraic equation?

What is an algebraic expression?

What do algebraic equations have that algebraic expressions do not have?

What is an equation in one variable? Write 3 examples.
Write the definition of **Linear Equation in One Variable**.

Linear equations are also called ______________________________ because the exponent of the variable is ________________________________.

Work through Example 1 and write your notes here.

Determine if the given value is a solution to the equation.

a. $2x + 3 = 11$; $x = 4$

b. $3y + 8 = 5y - 4$; $y = 2$

c. $\frac{2}{3}w - \frac{1}{2} = \frac{1}{4}$; $w = \frac{3}{8}$ For part c) watch the accompanying video on page 1.1-6.

**NOW WORK SECTION 1.1 HW EXERCISES #1-4**
Section 1.1 Objective 2: Solve Linear Equations in One Variable

Write down the Properties of Equality that are used to find simpler equations.

Work through Example 2 and write your notes here.

Use the properties of equality to solve each equation (be sure to show all work for checking your solution).

a. \( 3x - 1 = 5 \)

b. \( 8 = \frac{1}{2} n + 3 \)
Work through the video that accompanies Example 3 and write your notes here.
Solve: \(6x - 5 = 2x - 3\)

Work through the video that accompanies Example 4 and write your notes here:
Solve: \(5(x - 6) - 2x = 3 - (x + 1)\)

What is the **distributive property**? (Look at the solution to Example 4 in your e-text.)

**NOW WORK SECTION 1.1 HW EXERCISES #5-9**
(Fill in the Blanks)
When an equation contains fractions, it is usually best to ____________________ the fractions first. To do this, we multiply both sides of the equation by an appropriate common multiple of all the ___________________________, usually the ___________________________________ of all the fractions.

Work through the video that accompanies Example 5 and write your notes here:

Solve: \( \frac{x}{3} - \frac{5}{12} = \frac{5}{6}x - \frac{11}{12} \)

Work through the video that accompanies Example 6 and write your notes here:

Solve: \( \frac{1}{3} (1 - x) - \frac{x+1}{2} = -2 \)

NOW WORK SECTION 1.1 HW EXERCISES #10-13
(Fill in the Blanks)

When an equation contains decimals, we _____________________ the decimals by multiplying both sides of the equation by an appropriate _____________________ of 10, such as ______________, ______________, and ______________.

Work through the video that accompanies Example 7 and write your notes here:

Solve: $0.5n - 0.25 + 0.075n = 0.5 - 0.025n$

Work through the video that accompanies Example 8 and write your notes here:

Solve: $0.1(y - 2) + 0.03(y - 4) = 0.02(10)$

NOW WORK SECTION 1.1 HW EXERCISES #14-15
Skip Objective 3 and go to Objective 4 starting on page 1.1-19

Section 1.1 Objective 4: Use Linear Equations to Solve Application Problems

Write down the key words that all translate to an Equal Sign by filling in the table below. See Table 1 in your eText.

**Table 1**

<table>
<thead>
<tr>
<th>Key Words That Translate to an Equal Sign</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

What is the mathematical equation for “The product of 5 and a number is 45”?

The equation is: _______________________________

Work through Example 10:

Translate each sentence into an equation. Use $x$ to represent each unknown number.

a. Fifty-two less than a number results in $-21$.

b. Three-fourths of a number, increased by 8, gives the number.

c. The difference of 15 and a number is the same as the sum of the number and 1.

d. If the sum of a number and 4 is multiplied by 2, the result will be 2 less than the product of 4 and the number.

NOW WORK SECTION 1.1 HW EXERCISES #16-20
Go to page 1.1-24 of your eText.

Write down the 6-Step Problem-Solving Strategy for Applications of Linear Equations (See page 1.1-24)

Problem-Solving Strategy for Applications of Linear Equations

Step 1:

Step 2:

Step 3:

Step 4:

Step 5:

Step 6:
Work through the video that accompanies Example 13 and write your notes here:

Camille uses the cloud storage services *Dropbox* and *Google Drive* to store her photos in the cloud. The amount of storage she uses in *Google Drive* is 6 times the storage she uses in *Dropbox*. If she uses a total of 14 gigabytes of storage, how much storage does she use with each cloud service?

**NOW WORK SECTION 1.1 HW EXERCISES #21-22**
Go to page 1.1-29 of your eText.
Work through the Concept Animation and fill in the number lines below:

According to the concept animation, if \( x \) represents an integer, then label the next three consecutive integers.

According to the concept animation, if \( x \) represents an even integer, then label the next two consecutive even integers.

Work through the video that accompanies Example 16 and write your notes here:

Three consecutive even integers add to 432. Find the three integers.

NOW WORK SECTION 1.1 HW EXERCISES #23-24
Section 1.2 Task List
Work through each of the following tasks, carefully filling in the following pages in your notebook.

Section 1.2 Linear Inequalities in One Variable
☐ Work through Objective 1 then do problems #1-2
☐ Work through Objective 2 then do problems #3-7
☐ Work through Objective 3 then do problems #8-10
☐ Work through Objective 4 then do problems #11-18
Section 1.2 Linear Inequalities in One Variable

Section 1.2 Objective 1: Determine if a Given Value Is a Solution to an Inequality

Write down the 5 different types of inequality symbols.

Work through the interactive video that accompanies Example 1 and write your notes here:

Determine if the given value is a solution to the inequality.

a. \( 3x + 4 < 8; x = 2 \)

b. \( n^2 + 5n \geq 4; n = -6 \)

What is the difference between a strict inequality and a non-strict inequality?

NOW WORK SECTION 1.2 HW EXERCISES #1-2
Section 1.2 Objective 2: Graph the Solution Set of an Inequality on a Number Line

Read page 1.2-5.

What is set-builder notation and why is it used? Give an example of a set written in set-builder notation.

Sketch the set \( \{x | x < 4\} \) on a number line:
Work through Example 2 and write your notes here:

Graph each solution set on a number line.

a) \( \{x | x \geq 0\} \)

b) \( \{x | 1 < x \leq 7\} \)

c) \( \{x | x < 3\} \)

d) \( \{x | 0 < x < 4\} \)

e) \( \{x | x \neq -2\} \)

f) \( \{x | -1 \leq x \leq 5\} \)

g) \( \{x | -3 \leq x < 2\} \)

h) \( \{x | x \text{ is any real number}\} \)

NOW WORK SECTION 1.2 HW EXERCISES #3-7
Section 1.2 Objective 3: Use Interval Notation to Express the Solution Set of an Inequality

Work through the Concept Animation on page 1.2-8 and answer the questions below:

1. Graph the inequality \( a < x \leq b \) on a number line.

2. What is the correct interval notation for your graph from above?

3. Graph the inequality \( x \leq a \)

4. What is the correct interval notation for your graph from above?

5. What is the correct interval notation for the set of all real numbers?

This table summarizes three ways of expressing intervals:

<table>
<thead>
<tr>
<th>Graph</th>
<th>Interval Notation</th>
<th>Set-Builder Notation</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1" alt="Graph" /></td>
<td>((a, b))</td>
<td>({x\mid a &lt; x &lt; b})</td>
</tr>
<tr>
<td><img src="image2" alt="Graph" /></td>
<td>([a, b])</td>
<td>({x\mid a \leq x \leq b})</td>
</tr>
<tr>
<td><img src="image3" alt="Graph" /></td>
<td>((a, b])</td>
<td>({x\mid a &lt; x \leq b})</td>
</tr>
<tr>
<td><img src="image4" alt="Graph" /></td>
<td>((-\infty, b))</td>
<td>({x\mid x &lt; b})</td>
</tr>
<tr>
<td><img src="image5" alt="Graph" /></td>
<td>([a, \infty))</td>
<td>({x\mid x \geq a})</td>
</tr>
</tbody>
</table>
Work through Example 3 and take notes here.

Write each solution set using interval notation.

a) \( \{x | x < 5\} \)

b) \( \{x | 2 \leq x < 10\} \)

c) \( \{x | x \geq -3\} \)

d) \( \{x | -6 < x < 0\} \)

e) \( \{x | -1 \leq x \leq 5\} \)

f) \( \{x | x \text{ is any real number}\} \)

NOW WORK SECTION 1.2 EXERCISES #8-10
Section 1.2 Objective 4: Solve Linear Inequalities in One Variable

What is the definition of a linear inequality in one variable?

Work through the interactive video on page 1.2-11 to learn how to identify linear and nonlinear inequalities and take notes here.

Write down the 2 properties of inequalities seen below: (refer to page 1.2-12)

**Properties of Inequalities:**

Let \( a, b, \) and \( c \) be real numbers.

1. Addition Property of Inequality:

2. Multiplication Property of Inequality:
Work through Example 4 and take notes here.
Solve the inequality $4x - 8 \geq 6x + 6$. Graph the solution set on a number line and write the solution in interval notation.

Work through the video that accompanies Example 5 and take notes here.
Solve the inequality $2 - 5(x - 2) < 4(3 - 2x) + 7$. Write the solution set in set-builder notation.

Work through the video that accompanies Example 6 and take notes here.
Solve the inequality $\frac{m}{2} - 5 + 2m > -\frac{m}{4} + \frac{1}{2}$. Write the solution set in interval notation.

NOW WORK SECTION 1.2 HW EXERCISES #11-14
Work through the video that accompanies Example 8 and take notes here.

Solve the inequality \(-2 < \frac{3x - 5}{4} \leq 3\). Graph the solution set on a number line; write this solution in interval notation.

Work through the video that accompanies Example 9 and take notes here.

Solve the inequality \(-1.4 < 5 - 3.2x < 3.4\) and write its solution set in interval notation.

NOW WORK SECTION 1.2 HW EXERCISES #15-18
Section 1.4 Task List

Work through each of the following tasks, carefully filling in the following pages in your notebook.

Section 1.4 Absolute Value Equations and Inequalities

☐ Work through Objective 1 then do problems #1-5
Section 1.4 Absolute Value Equations and Inequalities

Section 1.4 Objective 1: Solve Absolute Value Equations

Fill in the blanks:

The absolute value of a number $a$, written as _______, represents the ______________ from $a$ to __________ on a ______________ line.

Work through the concept animation on page 1.4-3 and answer the questions below.

Solve the equation $|x + 2| = 5$.

Write down the Absolute Value Equation Property:

In the concept animation, work through the example $3|x - 5| - 7 = 11$.

Work through Example 1 and take notes here: Solve $|m + 4| = 8$. 
Work through the video that accompanies Example 2 and take notes here: Solve $|1 - 3x| = 4$.

Work through the video that accompanies Example 3 and take notes here: Solve $|2x - 5| = 0$.

Work through Example 4 and take notes here: Solve $|3x + 7| = -4$.

Write down the **Strategy for Solving Absolute Value Equations** (See page 1.4-8)

**Step 1:**

**Step 2:**

**Step 3:**

**Step 4:**
Work through the video that accompanies Example 5 and take notes here:
Solve $2|w - 1| + 3 = 11$.

Work through the video that accompanies Example 6 and take notes here:
Solve $-3|2 - m| + 8 = 2$.

NOW WORK SECTION 1.4 HW EXERCISES #1-5
Section 1.5 Task List

Work through each of the following tasks, carefully filling in the following pages in your notebook.

Section 1.5 Formulas and Problem Solving

☐ Work through TTK 3 then do problems #1-3
☐ Work through Objective 1 then do problems #4-10
☐ Work through Objective 2 then do problems #11-14
☐ Work through Objective 5 then do problems #15-18
Section 1.5 Formulas and Problem Solving

1.5 Things To Know

3. Use Linear Equations to Solve Application Problems (Section 1.1)
   Do you remember the 6-Step Problem-Solving Strategy for Applications of Linear Equations? (See your Week 1 notebook pages) Use this strategy to answer homework problems #1-3.

NOW WORK SECTION 1.5 HW EXERCISES #1-3
Section 1.5 Objective 1: Solve a Formula for a Given Variable

What is the definition of a formula?

What is the definition of perimeter?

Work through the interactive video on page 1.5-3 and use the formulas provided to find the value of the unknown variable.

a) \( P = 2l + 2w; P = 46\, \text{cm}, l = 13\, \text{cm}. \) Find \( w \).

b) \( A = lw; l = 12\, \text{in}, w = 8\, \text{in}. \) Find \( A \).

c) \( V = \frac{1}{3}Bh; V = 200\, \text{m}^3, h = 25\, \text{m}. \) Find \( B \).

We are often interested in solving for specific variables of a formula. In Example 1, we are given the formula for the area of a triangle and the formula for the perimeter of a rectangle. Work through Example 1 now and see if you can solve each formula for the given variable. (Part b has video solution)

\( A = \frac{1}{2}bh; \) Solve for \( b \). \hspace{1cm} b. \( P = 2l + 2w; \) Solve for \( l \).

NOW WORK SECTION 1.5 HW EXERCISES #4-10
Section 1.5 Objective 2: Use Formulas to Solve Application Problems

Click on the “Review” link on page 1.5-6 that shows common formulas for area and perimeter and complete each formula below:

**Square**

\[ A = \text{___________} \]
\[ P = \text{___________} \]

**Rectangle**

\[ A = \text{___________} \]
\[ P = \text{___________} \]

**Circle**

\[ A = \text{___________} \]
\[ C = \text{___________} \]

**Triangle**

\[ A = \text{___________} \]
\[ P = \text{___________} \]

**Trapezoid**

\[ A = \text{___________} \]
\[ P = \text{___________} \]

**Parallelogram**

\[ A = \text{___________} \]
\[ P = \text{___________} \]
Work through the video that accompanies Example 2 and write your notes here:
The length of a college basketball court (rectangle) is 6 feet less than twice its width. If the
perimeter is 288 feet, then what are the dimensions of the court?

NOW WORK SECTION 1.5 HW EXERCISES #11-12

Work through the video that accompanies Example 3 and write your notes here:
A 13-ounce Maxwell House coffee can has a surface area of $186\pi \text{ cm}^2$. Find the height of
the can if its radius is 5.0 cm.

NOW WORK SECTION 1.5 HW EXERCISES #13-14
Section 1.5 Objective 5: Solve Applications Involving Mixtures

Go to Objective 5 which starts on page 1.5-14 of your eText

What is the definition of concentration?

Work through the animation that accompanies Example 8 and take notes here.
Suppose 2 gallons of a 10% bleach solution is mixed with 3 gallons of a 25% bleach solution. What is the concentration of bleach in the new 5-gallon mixture?
Work through the video that accompanies Example 9 and write your notes here:

How many milliliters of a 70% alcohol solution must be mixed with 30 mL of a 40% alcohol solution to result in a mixture that is 50% alcohol?

(Fill in the blanks)

NOW WORK SECTION 1.5 HW EXERCISES #15-18
Section 2.1 Task List

Work through each of the following tasks, carefully filling in the following pages in your notebook.

Section 2.1 The Rectangular Coordinate System and Graphing

☐ Work through Objective 1 then do problems #1-6
☐ Work through Objective 2 then do problems #7-8
☐ Work through Objective 3 then do problems #9-10
☐ Work through Objective 4 then do problems #11-13
☐ Work through Objective 5 then do problems #14-15
Section 2.1 The Rectangular Coordinate System and Graphing

Section 2.1 Objective 1: Plot Ordered Pairs in the Rectangular Coordinate System

Read page 2.1-3 through page 2.1.5:

- What is an equation in two variables?

- Give three examples of an equation in two variables.

- Work through the interactive video on page 2.1-4 to practice identifying equations in two variables.

- What is another name for the rectangular coordinate system and who was the inventor of this system?
- Work through the concept animation on the bottom of page 2.1-4 and label the \( x \)-axis, \( y \)-axis, Origin, and label the four quadrants on the diagram below.

![Diagram of a coordinate plane]

Read page 2.1-6 and 2.1-7 and take notes here:

What is the definition of an **ordered pair**?

Work through the concept animation found on page 2.1-6 and fill in the blanks below:

When a point lies to the right of the origin, its \( x \)-coordinate is ________________.

When a point lies to the left of the origin, its \( x \)-coordinate is ________________.

When a point lies above the origin, its \( y \)-coordinate is ________________.

When a point lies below the origin, its \( y \)-coordinate is ________________
Work through the video that accompanies Example 1 and write your notes here:

Plot each ordered pair in the coordinate plane. In which quadrant or on which axis does each point lie?

\[ A(-4,4) \quad B(-5,-2) \quad C(0,-2) \quad D\left(\frac{3}{2},\frac{5}{2}\right) \quad E(3.5,-4.5) \quad F(2,0) \]
Section 2.1 Objective 2: Determine if an Ordered Pair is a Solution to an Equation

Describe what it means to be a solution to an equation in two variables.

Work through Example 2 and write your notes here:

Determine if each ordered pair is a solution to the equation $x + 2y = 8$.

a. $(-2,5)$

b. $(2,6)$

c. $(-11,\frac{3}{2})$

d. $(0,4)$

NOW WORK SECTION 2.1 HW EXERCISES #7-8

Section 2.1 Objective 3: Find Unknown Coordinates

Sometimes we are given one coordinate of an ordered pair that is a solution to an equation in two variables and wish to find the other coordinate. Carefully read page 2.1-11 and then work through the interactive video that accompanies Example 3.

Find the unknown coordinate so that each ordered pair satisfies the equation $3x + 4y = 20$.

a. $(8,?)$

b. $(?,2)$

c. $\left(-\frac{2}{3},?\right)$

NOW WORK SECTION 2.1 HW EXERCISES #9-10
Section 2.1 Objective 4: Graph Equations by Plotting Points

Every equation in two variables has a graph in the coordinate plane. The graph is the set of all ordered pairs that are solutions to the given equation. One way to graph an equation in two variables is to find several ordered pairs that are solutions, plot the points in the coordinate plane, and connect the points with a curve.

Write down the 3-step Strategy for Graphing Equations by Plotting Points

Step 1

Step 2

Step 3

Work through the interactive video that accompanies Example 4. (Part b and c are on the following page)

Graph each equation by plotting points.

a. \( 2x + y = 1 \)
b. \( y = x^2 - 4 \)

c. \( y = |x| \)

NOW WORK SECTION 2.1 HW EXERCISES #11-13
Section 2.1 Objective 5: Find $x$-and $y$-Intercepts

What is the definition of a $y$-intercept?

What is the definition of an $x$-intercept?

Take a look at your graph of $2x + y = 1$ from Example 4a on the previous pages. The $y$-intercept of $2x + y = 1$ is $\underline{\phantom{0}}$. The $x$-intercept of $2x + y = 1$ is $\underline{\phantom{0}}$.

Work through Example 5: What are the $x$-and $y$-intercepts of the graph below?

NOW WORK SECTION 2.1 HW EXERCISES #14-15
Section 2.2 Task List

Work through each of the following tasks, carefully filling in the following pages in your notebook.

Section 2.2 Relations and Functions

☐ Work through Objective 1 then do problems #1-4
☐ Work through Objective 2 then do problems #5-8
☐ Work through Objective 3 then do problems #9-11
☐ Work through Objective 4 then do problems #12-17
Section 2.2 Relations and Functions

Section 2.2 Objective 1: Identify Independent and Dependent Variables

Read page 2.2-3 and fill in the blanks.

When an equation is solved for a given variable, that variable is called the ________________ because its value ____________ on the value(s) of the ________________ variables.

Any remaining variables are called ________________ variables because we are free to ________________ their values.

Work through the Concept animation on page 2.2-3 and answer the questions below:

In the first example in the concept animation, what is the equation that is used to model the cost of gasoline?

__________________________________________

(Write the equation here)

In your equation above, which variable is the dependent variable?

Which variable is the independent variable?

In the example \( y = 10x - 15 \) seen in the concept animation, name the independent and dependent variables.

In the example \( A = lw \) seen in the concept animation, name the independent and dependent variables.

Make sure to watch the ending of the concept animation and fill in the blanks below:

When an equation involving the variables \( x \) and \( y \) is not solved for either variable, then the independent variable is understood to be _____ and the dependent variable is understood to be _____.

Work through Example 1: For each of the following equations, identify the dependent variable and the independent variable(s).

a. \( y = 3x + 5 \) b. \( w = ab + 3c^2 \) c. \( 3x^2 + 9y = 12 \)

NOW WORK SECTION 2.2 HW EXERCISES #1-4
Section 2.2 Objective 2: Find the Domain and Range of a Relation

Work through the Concept Animation at the bottom of page 2.2-5 and answer the questions below that come from this Concept Animation.

What is the definition of a relation?

Write the Example of the first relation seen in this Concept Animation:

What is the definition of the domain of a relation?

What is the definition of the range of a relation?

What is the domain of the relation from your example above?

What is the range of the relation from your example above?

Work through the Interactive Video that accompanies Example 2: Find the domain and range of each relation.

a. \[\{(-5,7), (3,5), (6,7), (12, -4)\}\] b. \[
\begin{array}{c}
(-4, 3) \\
(3, 4) \\
(2, 0) \\
(-2, -2) \\
(4, -5)
\end{array}
\]

NOW WORK SECTION 2.2 HW EXERCISES #5, 6
Work through the Interactive Video that accompanies Example 3 and work part a) and b): Find the domain and range of each relation.

a.

\[\begin{align*}
(−3, 4) & \quad (5, 3) \\
(−5, 2) & \quad (2, −3)
\end{align*}\]

b.

\[\begin{align*}
& \quad (3, 1)
\end{align*}\]

NOW WORK SECTION 2.2 HW EXERCISES #7, 8

Section 2.2 Objective 3: Determine if Relations are Functions

Work through the Concept Animation on page 2.2-8 and answer the questions below:

Write the domain and range of the relation below into the boxes provided.

Relation: \{(-2,4), (-1,5), (0,6), (1,7), (2,8)\}
In the Concept Animation on page 2.2-8, what is the definition of a function?

Definition
A function is

In the Concept Animation on page 2.2-8, explain why the relation \{((0,6), (1,7), (2,8), (2,9))\} is not a function.

Work through the video that accompanies Example 4 and work parts a), b), and c). Determine if each of the following relations is a function.

a. \{((-4,5), (-2,3), (0,1), (3, -2), (7, -6))\}

b. \{((3, -2), (6,5), (3,8), (-1, -10))\}

c. \{((-6,5), (-1,5), (4,5), (9,5), (14,5))\}

NOW WORK SECTION 2.2 HW EXERCISES #9-11
Section 2.2 Objective 4: Determine if Graphs are Functions

If we are given a graph of a relation, we can quickly determine if the relation represents a function by using the **vertical line test**. Define the vertical line test in the box below:

**Vertical Line Test**

Work through the **Concept Animation** that describes why the vertical line test works (page 2.2-11). Below are the two graphs seen in this animation. One of the graphs represents a function and the other does not. Explain why.
Work through the animation that accompanies Example 6: Use the vertical line test to determine if each graph is a function.

NOW WORK SECTION 2.2 HW EXERCISES #12-17