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Math 108
Intermediate
Algebra

Course Guide

Independent Study | in Idaho

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Math 108
Intermediate Algebra

University of Idaho
3 Semester-Hour Credits

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Kendrick High School
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Math 108: Intermediate Algebra   3 Semester-Hour Credits: UI

Welcome!

Whether you are a new or returning student, welcome to the Independent Study in Idaho (ISI) program. Below, you will find information pertinent to your course including the course description, course materials, course objectives, as well as information about assignments, exams, and grading. If you have any questions or concerns, please contact the ISI office for clarification before beginning your course.

Policies and Procedures

Refer to the ISI website at **www.uidaho.edu/isi** and select *Students* for the most current policies and procedures. These include information on setting up accounts, student confidentiality, exams, proctors, transcripts, course exchanges, refunds, academic integrity, library resources, and disability support and other services.

Course Description

Review of algebra including factoring, rational expressions, exponents, radicals, quadratic equations, equations of lines. UI students: carries no credit after Math 137 [Algebra with Applications] or 143 [Pre-calculus Algebra and Analytic Geometry]. Does not satisfy general education requirement. Polya Math Center unavailable for ISI students.

15 graded assignments, 5 self-study practice exams, 5 proctored exams

Students may submit up to 3 assignments at a time/6 per week. Before taking exams, students MUST wait for grades and feedback on assignments, which may take up to two weeks after date of receipt by the instructor.

ALL assignments and exams must be submitted to receive a final grade for the course.

Course Materials

Required Course Materials

Lial, Margaret L., John Hornsby, and Terry McGinnis. *Intermediate Algebra*. 8th ed. Boston. Pearson Education, Inc., 2005 or 2006. ISBN: 0321279204 ISBN-13: 978-0321279200

Course Delivery

This course is available online. An electronic course guide is accessible through Canvas at no additional cost. Refer to your *Registration Confirmation Email* for instructions on how to access Canvas.

Course Introduction

Mathematics is essential in nearly all aspects of your life. This course introduces you to specific problem-solving techniques. Also, you will learn strategies to help you solve problems that don't fit the "cookie-cutter" mold usually seen in textbooks.

Course Objectives

The primary objective of this course is to help you become competent (and confident) at solving algebra problems both in the textbook setting and a "real-life" setting. Additionally, the course will prepare you for higher math courses.

Lessons

This course is divided into 15 lessons. Each lesson contains a reading assignment with practice problems and self-study problems. The practice and self-study problems are **not** submitted for grading. There is also a written assignment for each lesson. Written assignments **are** submitted for grading. There are four regular exams and a final exam.

I expect my students actually to read the reading assignment! Most people who have ever taken a math course listen to the instructor lecture then go immediately to the exercises at the end of each section or chapter and get to work solving problems. Unfortunately, you don't have an instructor to listen to. This means you **must** learn how to read a math textbook as well as how to do the math. While this may seem a bit intimidating at the moment, be patient with yourself. It's not as bad (or as difficult) as you may think.

Each lesson includes the following components:
- Lesson objectives
- Reading assignment
- Important terms
- Lecture with practice problems
- Self-study problems
- Written assignment

Study Hints
- Keep a copy of every lesson submitted.
- **Complete** all assigned readings.
- Set a schedule allowing for completion of the course one month prior to your desired deadline. (An *Assignment Submission Log* is provided for this purpose.)
- **Do** the practice and self-study problems. It's very easy to ignore these because they are not graded and you think you understand the material. I can just about guarantee those students who do the practice and self-study problems will have much more success and fun during the course than those who do not! You can find answers to old numbered problems in the back of the book. Answers to even-numbered practice problems and the self-study problems are provided for you at the back of this course guide. Check your solutions for the practice problems and the self-study problems against the solution provided. If you cannot come up with the correct solution, then you may request a full, written explanation for each problem by email from your instructor.
- **Show your work!!!** I will not give credit for correct answers if there is no work. Mathematics (in my opinion) is not just about getting the right answer. It is also about demonstrating how you got that answer. In other words, **show your work.**

This is a math class. You will make mistakes. You will need to erase mistakes. Therefore, all written assignments must be done in **pencil**. Please use the following format:
- Write the original problem statement down (except for story problems).
- Write out the necessary steps to solve it.
- Work vertically (top to bottom) on the page.
- Have no more than two columns per page.
- Circle your answer.
- Check your work!
- It would be nice if you could leave room for me to make suggestions and/or corrections.

Refer to the *Course Rules* in Canvas for further details on assignment requirements and submission.

Exams

- You must wait for grades and comments on lessons prior to taking each subsequent exam.
- For your instructor's exam guidelines, refer to the letter sent in your registration packet and the *Exam Information* sections in this course guide.
- **Show your work!!!** I will not give credit for correct answers if there is no work. Mathematics (in my opinion) is not just about getting the right answer. It is also about demonstrating how you got that answer. In other words, **show your work.**

There will be four one-hour examinations in this course and a comprehensive, two-hour final examination. Each of the hour exams will consist of problems from the three lessons preceding it. The problems will be similar to the problems you have completed in the practice, self-study, and written assignments.

The final exam will be similar to the hour exams except that it is two hours long and will be comprehensive (covering material from the entire course).

Scientific calculators are allowed but not necessary. Graphing calculators are NOT allowed.

Practice Exams

There are chapter tests in the textbook with answers. I have also included practice exams for you in this course guide. Answers to the practice exams are at the back of the course guide. These are for you and should not be submitted for grading.

See *Grading* for specific information on exams, points, and percentages.

All exams require a proctor. To submit your *Proctor Information Form* online, visit the ISI website and select *Forms, Proctor Information Form*. Submit this form at least two weeks before your first exam. Refer to *About ISI Policies* on the ISI website for information on acceptable and unacceptable proctors.

Grading

The course grade will be based upon the following considerations:

5 Written Lessons (30 pts each):	150 pts
4 Exams (100 pts each):	400 pts
1 Final Exam (200 pts):	200 pts
Overall Course Pts	750 pts

A letter grade will be assigned upon completion of the course as follows:

675–750 points	A
600–674 points	B
525–599 points	C
450–524 points	D
0–449 points	F

The final course grade is issued after all assignments and exams have been graded.

Acts of academic dishonesty, including cheating or plagiarism, are considered a very serious transgression and may result in a grade of F for the course.

About the Course Developer

I wrote this course and although I am not the instructor I would like to introduce myself.

My name is Pat Rush. I received my Bachelor of Science in Education in 1995 and my Master of Education in 2003 (both at the University of Idaho). I was a nontraditional (politically correct way to say "old") student. While attending UI, I was working full-time and following my children to every activity ever invented! It was a hectic time, but I wouldn't trade it for a million dollars. My guess is that many of you are doing something similar. Trust me—it is well worth the effort.

I taught Math 108, 137, and 143 at the University of Idaho for four years. Since 1999, I have been teaching at the high school level in Kendrick. This is a small town, small school. I teach all levels of math at our high school as I am the only math teacher. I must tell you, I **love** teaching this subject. I think of algebra as a game—like a jigsaw puzzle. I only need to get the pieces in the right places to get it finished. I have a great time with my students**.** I expect them to work hard and they haven't let me down yet. In the midst of all this hard work though, we do take the time to share some jokes and have some fun.

Contacting Your Instructor

Instructor contact information is posted on your Canvas site under *Course Rules.*

Assignment Submission Log

Lesson	Section	Reading	Self-Study Assignment	Written Assignment	Date Submitted
1	1.4, 2.1, 2.2	pp. 35-40 pp. 54-59 pp. 65-69	p. 42, #34 p. 62, #24, 54 p. 72, #16, 28	p. 42, #36 p. 62, #32, 62 p. 72, #22, 36	
2	2.3, 2.4, 3.1	pp. 77-84 pp. 91-94 pp. 114-122	p. 86, #20, 46 p. 96, #14 p. 123, #8, 40	p. 86, #32, 52 p. 96, #22, 24 p. 123, #30	
3	3.2, 3.3, 4.1	pp. 129-133 p. 139-142 pp. 167-172	p. 136, #30, 50 p. 147, #44 p. 174, #12, 40	p. 136, #40, 56 p. 147, #48, 56 p. 174, #36	

Complete Practice Exam 1. Answers are in the back of this course guide. If you have any problems or confusion, contact your instructor or tutor for clarification before taking Exam 1.

It is time for you to make arrangements with your proctor to take Exam 1.

Lesson	Section	Reading	Self-Study Assignment	Written Assignment	Date Submitted
4	4.2, 4.3	pp. 177-184 pp. 191-196	p. 186, #32, 38 p. 200, #24, 36, 68	p. 186, #50 p. 200, #22, 40, 50, 54	
5	4.5, 5.1	pp. 213-222 pp. 252.260	p. 224, #16, 42, 54 p. 262, #10, 45	p. 224, #22, 50, 68 p. 262, #24, 30	
6	5.3, 6.1	pp. 277, 284 pp. 312-321	p. 285, #4, 24 p. 324, #44, 52, 124	p. 285, #18, 28 p. 324, #28, 80, 102	

Complete Practice Exam 2. Answers are in the back of this course guide. If you have any problems or confusion, contact your instructor or tutor for clarification before taking Exam 2.

It is time for you to make arrangements with your proctor to take Exam 2.

Lesson	Section	Reading	Self-Study Assignment	Written Assignment	Date Submitted
7	6.2, 6.3	pp. 329-332 pp. 335-339 pp. 343-348	p. 333, #16, 18, 20, 52 p. 341, #24, 32 p. 350, #38, 86	p. 333, #56 p. 341, #6 and 16 (Parts A and B for both problems), #26, 34 p. 350, #30, 50	
8	6.4, 6.5, 7.1	pp. 353-356 pp. 372-376	p. 357, #10, 46 p. 377, #32	p. 357, #22 p. 377, #22, 50	
9	7.2, 7.3	pp. 379-384 pp. 387-390	p. 385, #8, 26, 46 p. 391, #24, 38	p. 385, #10, 32 p. 391, #12, 42, 46	

Complete Practice Exam 3. Answers are in the back of this course guide. If you have any problems or confusion, contact your instructor or tutor for clarification before taking Exam 3.

It is time for you to make arrangements with your proctor to take Exam 3.

Lesson	Section	Reading	Self-Study Assignment	Written Assignment	Date Submitted
10	7.4, 8.1	pp. 395-399 pp. 414-420	p. 402, #20, 32, 42, 44 p. 422, #48	p. 402, #28, 40 p. 422, #36, 62, 76	
11	8.2, 8.3, 8.4	pp. 425-430 pp. 435-438 pp. 441-444	p. 432, #38, 54 p. 439, #14, 30 p. 446, #20	p. 432, #64 p. 439, #20, 32 p. 446, #24, 36	
12	9.1, 9.2	pp. 27-28 pp. 480-484 pp. 489-493	p. 486, #26, 48 p. 496, #42, 58, 88	p. 486, #34 p. 495, #22, 28, 66, 76	

Complete Practice Exam 4. Answers are in the back of this course guide. If you have any problems or confusion, contact your instructor or tutor for clarification before taking Exam 4.

It is time for you to make arrangements with your proctor to take Exam 4.

Lesson	Section	Reading	Self-Study Assignment	Written Assignment	Date Submitted
13	9.3, 9.4, 9.5	pp. 499-504 pp. 511-512 pp. 515-520	p. 507, #54, 92, 104, 114 p. 513, #28, 48, 54 p. 521, #22, 60, 66	p. 507, #72, 98, 106 p. 513, #18, 44, 52 p. 521, #14, 40, 74, 82	
			*NOTE: This assignment is longer than all the rest.		
14	9.6, 9.7	pp. 527-530 pp. 535-540	p. 531, #10, 20 p. 541, #14, 28, 46	p. 531, #14, 34 p. 541, #18, 44, 58	
15	10.1, 10.2	pp. 558-564 pp. 569-573	p. 565, #10, 54, 62 p. 575, #4, 14	p. 565, #16, 44, 66 p. 575, #8, 22	
	HINT: For these problems, first find the discriminant and determine the nature of the roots; then solve the problem.				

Complete Practice Final Exam. Answers are in the back of this course guide. If you have any problems or confusion, contact your instructor or tutor for clarification before taking the Final Exam.

It is time to make arrangements with your proctor to take the Final Exam.

Lesson 1
Properties of Real Numbers and Linear Equations

Lesson Objectives

After completing this lesson, students will be able to do the following:
1. Use the distributive property and others.
2. Solve linear equations including those with fractions and decimals.
3. Solve and apply formulas.
4. Solve percent problems.

Reading Assignment

Read pages 35–40, 54–59, 65–69.

Important Terms

distributive property	inverse property
identity property	commutative property
associative property	multiplication property of 0
algebraic expressions	algebraic equations
linear equation	formula
addition and multiplication properties of equality	

Lecture

Note: This is a good time to become familiar with your textbook. You will notice that the important words and/or concepts are highlighted in bold text and in blue boxes. You may find it helpful to put this information on 3 x 5 index cards and make yourself a set of "flash cards" as a study tool. Also, when I assign practice, self-study, or written problems, I will just give you the first page number even though the problems may be spread out over two or three pages.

1.4 Properties of Real Numbers
- ♦ **Real numbers** are the numbers we work with every day. These include integers, fractions and decimals. Please don't let the language of mathematics scare you off!
- ♦ The **distributive property** is incredibly important. Be sure you understand how to use it. While the other properties listed are important, I don't really care if you know their names. It's more important that you know how and when to use them and that will come with practice.
- ♦ Be sure you can recognize **like** terms.
- ♦ Although the book hasn't made a big deal about it, I think it is time to point out the difference between **terms** and **factors.**
  1. *Factors* are the numbers and/or variables being multiplied together.
     Example: –5*abc* has factors of –5, *a*, *b,* and *c*.
  2. A *term* is an indicated product that may have any number of factors.
     Example: In 7*xy* + 5*abc,* 7*xy* is a term with factors 7, *x,* and *y*. 5*abc* is a term with factors 5, *a, b,* and *c*.
- ♦ As a general rule, terms are separated by a + or – sign.

  Practice Problems
  Work page 41, #1–10, 11, 15, 19, 23, 27.
  (Answers to even-numbered problems are given toward the back of this course guide.)

2.1 Linear Equations in One Variable

♦ An expression *does not* contain an equal sign. It can only be simplified. It is considered an **algebraic expression** when it contains variables such as *x* or *y*.

♦ An equation *does* contain an equal sign. Equations must be solved. An **algebraic equation** contains at least one variable.

♦ You will see the term **linear equation** used frequently. What makes an equation linear is the fact that the variable is never raised to a **power** other than one. When the power (or **exponent**) of a number or variable is one, we don't write it. For example: x^1 is the same as x. For this reason, these equations are sometimes called **first-degree equations.**

♦ As you read this material, take your time! These are the building blocks for much of what we will do during the course. It is essential that you understand the concepts.

♦ You can do anything you want to an equation as long as you do it to both **sides**.

♦ I like the way this text explains solving equations involving fractions (I call these **fractional equations**) and decimals.

♦ Here is another example of a fractional equation,

$$\frac{3a-1}{4} + \frac{a-2}{3} - \frac{a-1}{5} = \frac{21}{20} \quad \text{LCM is 60, so}$$

$$60\left(\frac{3a-1}{4} + \frac{a-2}{3} - \frac{a-1}{5}\right) = 60\left(\frac{21}{20}\right)$$

$$60\left(\frac{3a-1}{4}\right) + 60\left(\frac{a-2}{3}\right) - 60\left(\frac{a-1}{5}\right) = 60\left(\frac{21}{20}\right)$$

$$15(3a - 1) + 20(a - 2) - 12(a - 1) = 3(21)$$

$$45a - 15 + 20a - 40 - 12a + 12 = 63$$

$$53a - 43 = 63$$

$$53a = 106$$

$$a = 2$$

Practice Problems
Work page 61, #9–41 (every other odd), 43, 49, 55, 59.

2.2 Formulas

♦ Solving **formulas** for a specific variable is not only fun, but it is also very useful. I like to call these **manipulation** problems because you are manipulating the formula to make it useful for *you!*

♦ **Percent** problems always give people trouble. Percent is from Latin: *per* means "by," *centum,* "one hundred." This means, for us, "by hundreds."

♦ I teach my students that percent is the *part divided by the whole.* In this text, the authors say the same thing, but they phrase it differently, saying that percent is the *partial amount (a)* divided by the *whole amount (b).* What you need to do is figure out what makes sense to you and use that.

Practice Problems
Work page 72, #7–17 odd, 21, 27, 35, 37.

Self-Study Problems

Work the following pages and problems on your own, and then check your solution against the solution provided in Canvas. If you cannot come up with the correct solution, then you may request a full, written explanation for each problem by email from your instructor. Do not submit the self-study assignments to your instructor for grading.

42 (#34)
62 (#24, 54)
72 (#16, 28)

Written Assignment

Written Assignments for Lesson 1-3 will be submitted together via Canvas (15 problems worth 2 pts each):

Work the following pages and problems for Lesson 1. Then move on to Lesson 2. Once you have worked the written assignment problems for Lessons 1, 2 and 3, combine them, and submit them Canvas in PDF format.

42 (#36)
62 (#32, 62)
72 (#22, 36)