

- multiple perspectives including local to global connections
- truth & consequences, the role of chance and probability
- ways people succeed in and impact
- what mathematics is & offers

Tentative Calendar for Fall 2024 WRC 1010

Some items have strict deadlines, including exams and the final project components. Many labs are mostly completed during the Monday class—typically, you should submit a PDF for completion credit by Tuesday in the ASULearn assignment but if you weren't able to succeed, you can typically resubmit by Thursday at the latest. Practice quizzes are repeatable until the listed deadline. However, if you weren't able to succeed by that deadline then a second chance will appear for you and stay open until closer to the relevant exam, but the checkmark is easier to obtain when it is originally due (70% instead of 90%). All other activities are those you should attempt for completion by the listed due date—some may have strict deadlines while others are open until closer to the corresponding exam.

	Mon	Between Classes	Tues	Between Classes	Thur	Between Classes
8/19–8/22	intro	calculator and polling What is Mathematics? 1010 intro video percent practice	lump sum	lump practice submit handwritten PDF add ASULearn profile pic add Zoom profile pic	lump sum t-shirt day	read THoM lump real-life rates read Franklin's legacy read syllabus
8/26–8/29	Franklin's financial legacy	review and finish Franklin's financial legacy lab read THoM periodic periodic interactive video	periodic payments	lump and periodic practice	lottery decisions t-shirt day	read THoM loans
9/3–9/5	State Holiday		loan payments	study guide finance reflection	loans t-shirt day	loan practice
9/9–9/12	home decisions	review and finish home decisions lab glossary/wiki	loans	review practice	review t-shirt day	debrief review problems
9/16–9/19	car decisions	inspect partial sample exam prepare for exam complete open items	exam 1	What is Mathematics 2	geometry intro t-shirt day	read THoM geom intro geom intro practice
9/23–9/26	geom intro lab	review and finish geom intro lab	artwork perspectives	earth and universe research	measuring, representing, and applying 2D univ t-shirt day	read THoM 2D universes Klein bottle Tic-Tac-Toe video
9/30–10/3	2D universe lab	review and finish 2D universe lab	living in a 2D universe	2D universes practice	earth t-shirt day	read THoM earth earth practice

Statement on Student Engagement with Courses

In its mission statement, Appalachian State University aims at "providing undergraduate students a rigorous liberal education that emphasizes transferable skills and preparation for professional careers" as well as "maintaining a faculty whose members serve as excellent teachers and scholarly mentors for their students." Such rigor means that the foremost activity of Appalachian students is an intense engagement with their courses. In practical terms, students should expect to spend two to three hours of studying for every hour of class time. Hence, a fifteen-hour academic load might reasonably require between 30 and 45 hours per week of out-of-class work.

[Printable PDF of the Statement on Student Engagement with Courses \(PDF, 48 KB\)](#)

Links

APPSTATE



need help from me, math dept tutoring, your classmates, or tech support?

I care about your success and feel a great responsibility to you
as my student

Try it Out!

readings
class and lab activities
ASULearn practice

Review and Understand Misconceptions

think-share-pair-compare
review feedback
review activities

Solidify and Make Connections

exams
final project

Making mistakes is integral to the learning process and
enriches our understanding as we extend content and clear up
misconceptions.

ASULearn Completion Activities



scientific calculator & polling

✓ Done



What is Mathematics?

To do ▾



1010 intro video

To do ▾



percent practice

You must

✓ Receive a grade

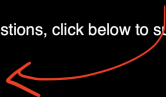
✗ Receive a passing grade

★ 5 Question(s) answered



You have answered 5 questions, click below to submit your answers.

✔ Submit Answers



Answered questions

Score

1:32	Calculate the future value of the 1st payment	1 / 1
1:48	future value of 2nd payment	1 / 1
4:33	If we have like terms raised to different powers, how can...	1 / 1
6:18	Consider how we simplified the future value to only a cou...	1 / 1
7:32	try the periodic payment on your calculator	1 / 1

● scientific calculator & polling

○ What is Mathematics?

✗ 1010 intro video

○ percent practice



scientific calculator & polling

✓ Done



What is Mathematics?

To do ▾



1010 intro video

To do ▾



percent practice

You must

✓ Receive a grade

✗ Receive a passing grade

● scientific calculator & polling

○ What is Mathematics?

● 1010 intro video

○ percent practice



scientific calculator & polling

✓ Done



What is Mathematics?

To do ▾



1010 intro video

✓ Done ▾



percent practice

To do ▾

practice with instantaneous feedback from me, repeatable
Instantaneous Feedback opens after you Check a response,
so you can retake it. For a box, red x for feedback.

Calculate this **probability** as a decimal and then convert that decimal to a **percent**. What is this **probability** written as a **percent**?

- ☐ .4%
- ☐ .004%
- ☒ .00004%
- ☐ 99.6%
- ☐ other

Check

If \$1000 is deposited into an account paying 5 **percent interest** in one year, how much money will be in the account after one year?

In finance we will round money to dollars and cents unless otherwise specified, so write your answer as a decimal rounded to two decimal places.
1234.00 or 1234.00

\$ 3.14



Incorrect

multiply the deposit by .05, since $5\% = .05$
and then write as dollars and cents

Use my feedback to check responses until correct.

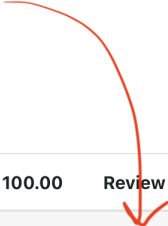
Re-attempt quiz

Grading method: Highest grade

Grade to pass: 70.00 out of 100.00

Summary of your previous attempts

Attempt	State	Points / 31.00	Grade / 100.00	Review
1	Finished	18.90	60.97	Review



What percent of 188 is 47?

.25



incorrect

almost there-convert this to a percentage

The correct answer is: 25

0.00 points out of 1.00

*Instantaneous feedback
from the Check: repeatable*

"of" typically means multiply in real-life contexts of algebra

What is 15% of 200? convert the percentage of 15% to a decimal .15 and then multiply by 200

*General feedback below each question
when you Review a quiz*

8% of what number is 122? asks for a number x so that $.08x=122$, ie divide both sides by .08

What percent of 188 is 47? asks for a percentage x so that $x188=47$, so divide by 188 and then write as a percent

Use my feedback to check responses until correct.

%

Percent means out of 100, so 5% is $\frac{5}{100} = .05$, i.e. moving the decimal place over to the left 2 places. To convert a number like .004 to a percentage we do the reverse and move 2 places to the right so $.004 = .4\%$. Historically multiples of $\frac{1}{100}$ were common in taxation and computations. The decimal version came much later!

OK

practice with instantaneous feedback from me, repeatable
Instantaneous Feedback opens after you Check a response
so you can retake it. For a box, hover for feedback

Calculate this probability as a decimal and then convert that decimal to a percent. What is this probability written as a percent?

☐ .4%


☐ .004%

☒ .00004%

☐ 99.6%

☐ other

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1234.00 or 1234.56 as.

\$ 3.14



Incorrect

multiply the deposit by .05, since 5% = .05
and then write as dollars and cents

Use my feedback to help! Check responses until correct.



read THoM lump



Mark as done



read THoM lump



Mark as done

read *The Heart of Mathematics*

- pp. 793–796 in 10.3

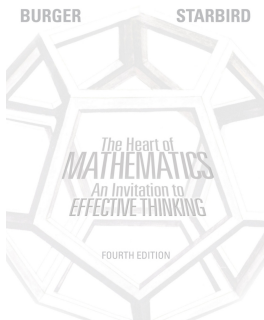
starting at Money Matters, Deciding Between Faring Well and Welfare, Who Wants to Be a Millionaire? [Compounding](#) more Frequently, A [Compounding](#) Pattern, and 2 Versus 3—the Difference that One [Percentage](#) Point Makes with Adam and Eve.

Stop just before Lottery

the book is found at the top of ASULearn under the My Materials link .

When you are finished, manually mark the box in ASULearn as done.

Accessing the Book at the top of ASULearn



need help from me, math dept tutoring, your classmates, or tech support?



My Materials to access The Heart of Mathematics (THoM)



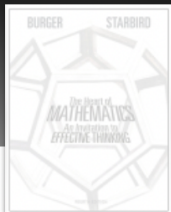
in-class items, slides and more



Dr. Sarah's announcements

Item Info

Notes ●



The Heart of Mathematics: An Invitation to Effective Thinking, Enhanced eText

ISBN: 9781119668282

By: Edward B. Burger; Michael Star...



Digital



Opted In

Included in New Rental Program

Required

Read Now



The Heart of Mathematics: An Invitation to Effective Thinking, Enhanced eText

Edward B. Burger, Michael Starbird

Expand | Collapse

Chapter Two: NUMBER CONTEMPLATION	42
Chapter Three: INFINITY	138
Chapter Four: GEOMETRIC GEMS	206
Chapter Five: CONTORTIONS OF SPACE	324
Chapter Six: MODELING OUR WORLD THROUGH GRAPHS	384
Chapter Seven: FRACTALS AND CHAOS	456
Chapter Eight: TAMING UNCERTAINTY	562
Chapter Nine: MEANING FROM DATA	644
Chapter Ten: DECIDING WISELY	760
Farewell	842
Acknowledgments	845
Index	854
End User License Agreement	868

CHAPTER TEN Deciding Wisely: Applications of Rigorous Thinking

Few people think more than two or three times a year. I have made an ill reputation for myself by thinking once or twice a week.

GEORGE BERNARD SHAW

Life is one decision after another. We make decisions every waking moment: whom to date, whom to marry, whether to eat dessert tonight, what to think and wear, whom to vote for, whether to use correct grammar, what college to attend, investments to make, what car to buy, what medicines to take, how much to spend, whether to hold 'em or fold 'em, whether to buy a lottery ticket or study. These decisions alter a moment or an entire life.

Each realm of decision making contains its own surprises, and sometimes the surprises are discouraging. For example, consider the seemingly simple task of determining the candidate most preferred by voters. Sounds simple enough—just count the ballots. Surprise: We'll see that the whole notion of "most preferred candidate" is essentially meaningless. On the encouraging side, we'll see that we can allocate scarce resources in ways that leave everyone satisfied. In fact, we will show that a highly desirable cake can be cut into three pieces so that three greedy and hungry claimants definitely all feel that they have the best piece. We can productively view insurance decisions as games of chance not much different from roulette. And money matters present issues that range from chaotic to inevitable. When we throw in the risks of life and death involved in issues of medicine and health, the world of decisions takes on an immediacy and importance that encourages us to give math a chance.

With all these decisions to be made—public and private, large and small—improving our chances of making good decisions is crucial. The strategies of insight that have worked over and over in mathematics are equally potent when applied to making decisions. These strategies include understanding simple cases deeply, isolating essential elements from a complex situation, and describing a mathematical model that captures salient features of the decision situation. We now embark on an excursion into the world of thoughtful decision making.

10.1 GREAT EXPECTATIONS

Deciding How to Weigh the Unknown Future



Read Aloud

Print

Beta Features

Feedback

Help

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Download App



< 760 / 868 >



The Heart of Mathematics: An Invitation to Effective Thinking, Enhanced eText

Edward B. Burger, Michael Starbird

Expand | Collapse

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CHAPTER TEN

Deciding Wisely: *Applications of Rigorous Thinking*

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10.1 GREAT EXPECTATIONS

Deciding How to Weigh the Unknown Future





read THoM lump



Mark as done



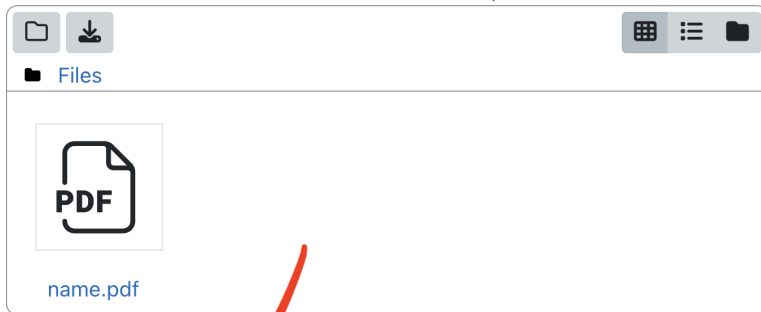
read THoM lump



✓ Done

collate handwritten labs into 1 multipage PDF

Maximum file size: 800 MB, maximum number of files: 1



Accepted file types:

PDF document .pdf

Save changes

Cancel

Feedback files



Grade breakdown

scale	no grade	Padawan (still training)	Jedi	Jedi Master	see your personalized feedback
-------	----------	--------------------------------	------	----------------	-----------------------------------

- Padawans are training to one day become a Jedi. **resubmit**

Edit submission

Remove submission

- Both Jedi and Jedi Master ratings earn completion.
- I'll respond with feedback on your PDF



Here is a partial sample exam so that you can have some practice with some diverse formatting and style of questions. The actual test will differ and may be longer. See also the study guide, which has sample responses to questions at the end.

Exam 1 Math 1010 - NAME _____

Partial credit will be granted so do continue on with a problem even if you know that one part is wrong. If part b) depends on part a), full credit can still be obtained for b) by showing the correct process.

"Set up a formula with numbers substituted in for the variables" means that you should set up something similar to $100(1 + .049)^{120}$ (using the appropriate formula and numbers)

"Show work" means that you should show what numbers you plugged in to formulas to get an answer (i.e. $3 \times 2 = 6$ or $7 - 3 = 4$) but there is no need to explain in words.

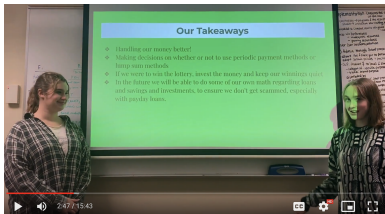
PROBLEM 1: Yusuf is taking out a loan to buy an apartment. The interest rate was 6.75% compounded monthly for 30 years. The loan amount was \$84212.00.

- Set up a formula with numbers substituted in for the variables in order to determine the required monthly loan payment
- Solve for an answer for the required monthly payment.
- How much interest (\$) does he pay in total over the life of the loan? Show work.
- Does your answer in c) make sense? If yes, just say so. If not, explain why not.
- What is the interest (\$) for the first month? Show work.
- Why isn't the answer in part c) equal to the answer in part e) divided by 360, i.e. the average interest (where I obtained 360 by the number of months)?

Instead of paying the required monthly payment of \$466.20 from part b), beginning with the first payment, Yusuf decides to pay \$400 each month. On Excel, we see the following:

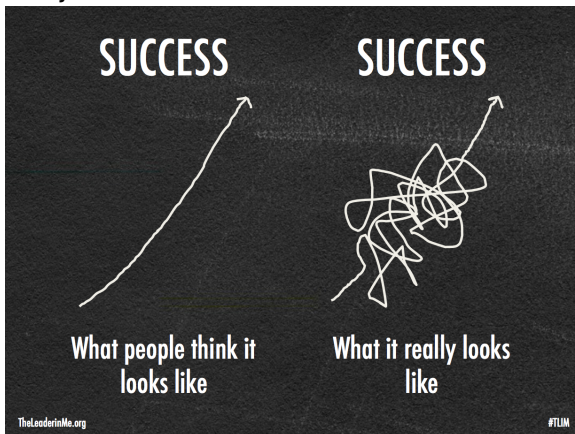
Month #	Monthly Payment	Monthly Interest (\$)	Principal Paid	Loan Balance
277	\$600.00	\$6.01	\$593.99	\$473.73
278	\$600.00	\$2.66	\$597.34	(\$123.61)

- Use this Excel to determine how much he pays in total now. Show work.
- How much total interest (\$) does he pay over the life of the loan now? Show work.



This Semester in Review final project video by Dottie Benninghofen and Stella Hopkins

- Effective Class Engagement 5%
- Effective ASULearn Engagement 50%
lowest 3 dropped
- Exam Portfolio 30%
can correct 1 of 3 exams to replace the grade
- Final Project 15%



Monday Labs

● Bring the lab with you. I'm here to help!

2D universes

Dr. Sarah's 1010: Introduction to Mathematics

Geometry of the Earth and Universe

How we measure and view the world around us and decide what is the nature of reality.

goals:

- Develop problem solving and analysis skills in recognizing patterns and similarities in geometric representations to work towards becoming logical, flexible, critical thinkers and problem solvers.
- Compare and contrast small-scale and large-scale mathematical regions.
- Communicate geometric information in written documents.

Living in a 2D World

1. How could a 2D Marge Simpson and 2D Lisa Simpson still “pass” each other if they live on an infinite 2D plane, even though they can’t walk behind each other (since their surface has no depth and they would bump into each other)?
2. In order to explain a cube to 2D folks and to Homer Simpson, who is trapped in the “third” dimension, a (supposedly) 2D Professor Frink says:
Frink: – but suppose we exte-end the square beyond the two dimensions of our universe (along the hypothetical z-axis, there).

Everyone: [gasps]

Frink: This forms a three-dimensional object known as a “cube”, or a “Frinkahedron” in honor of its discoverer, n’hey, n’hey. [Taken from text transcript of 3D Homer segment and Did You Notice? by James A. Cherry]



Assume the shaded portion on  is the square that is referenced above. Label a z -axis, out of the base, on this “Frinkahedron.”

Image: Davide P. Cervone <http://www.math.union.edu/~dpvc/math/3d/welcome.html>

Tues/Thur Questions handout

1010 Personal Finance and Beyond Algebra T/Th Questions

Here are portions of questions from class to help you with your notes or later practice. The wording and ordering may change and we may not have time to cover all of them. Here we actively practice concepts, computational strategies, critical & creative thinking, and communication. Making mistakes is integral to the learning process and enriches our understanding as we extend content and clear up misconceptions.

- **Think** about a possible answer(s) on your own.
- **Pair up:** discuss your thoughts in a group. We may reorganize groups at times.
- Prepare to **share** from your group's discussion. This may take the form of an assertion, question, definition, example, or other connection. It could be something you tried and rejected.
- May be a lag at times—use this to **review** related concepts and examples, and **add** to your notes, or get to know your neighbors.

Appalachian's General Education Program prepares students to employ various modes of communication. Successful communicators interact effectively with people of both similar and different experiences and values and in this class you will practice oral and written communication during class by interacting with various peers and me.

lump earnings

- Suppose we deposit \$1000 in a savings account that pays 5% interest compounded monthly for 142 years—how much will we have in total savings?
- Which is better interest in this scenario, compounding annually, compounding monthly, or are they the same?
- Which do you think best explains why it does make sense to charge interest?
- Which do you think is most compelling of why it might not make sense to charge interest?
- If you were going to design an independent, self-sustaining, space mission, who travel far away to continually explore the geometry of the universe, would you charge interest within that community

Tues/Thur Class

- bring the T/Th Questions handout, calculator, and (if possible) a computer, tablet or phone with you to access webpages
- active learning and guided discovery that is review or extension
- small group—help each other—and whole class activities I'm here to help!
- individual and group assessments



A screenshot of a PollEv poll interface. At the top, it shows the URL 'pollev.com/drsarah314' and a status 'Open ended response'. Below this, it says 'You can respond once' and 'This question is anonymous. No names will be tracked.' The main part of the interface consists of five horizontal input fields labeled A, B, C, D, and E.



no eating or drinking in class, but you may step out if you need to hydrate or similar!



need help from me, math dept tutoring, your classmates, or tech support?



My Materials to access The Heart of Mathematics (THoM)



in-class items, slides and more



Dr. Sarah's announcements

hw due:

- ☐ ASULearn read THoM pp. 793-796
- ☐ ASULearn research real-life rates
- ☐ ASULearn read Benjamin Franklin's Financial Legacy-3 News Article Readings
- ☐ ASULearn read syllabus

lab: [Benjamin Franklin's financial legacy](#), [benf1.xls](#)



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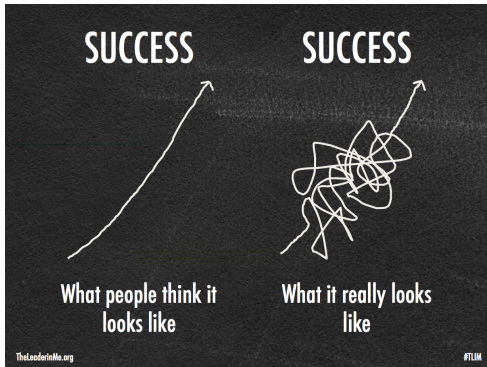
- Dr. Sarah's e-Z check-in (internet allowing)
Tuesday, Thursday 9:45–10:15am
Sunday, Monday, and Wednesday 7–7:45pm
drop in—no appointment needed
- private or whole class forum & math tutoring
- use my instant feedback and personalized feedback to help: **keep scrolling down**
- advice from prior students from syllabus

I care about you and your success!



<http://alangregerman.typepad.com/.a/6a00d83516c0ad53ef0168e783575e970c-800wi>

- Personal Finance and Beyond Algebra
- Geometry of the Earth and Universe
- Consumer Statistics and Probability
- What is Mathematics?



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<https://www.leaderinme.org/blog/the-power-of-a-growth-mindset/>