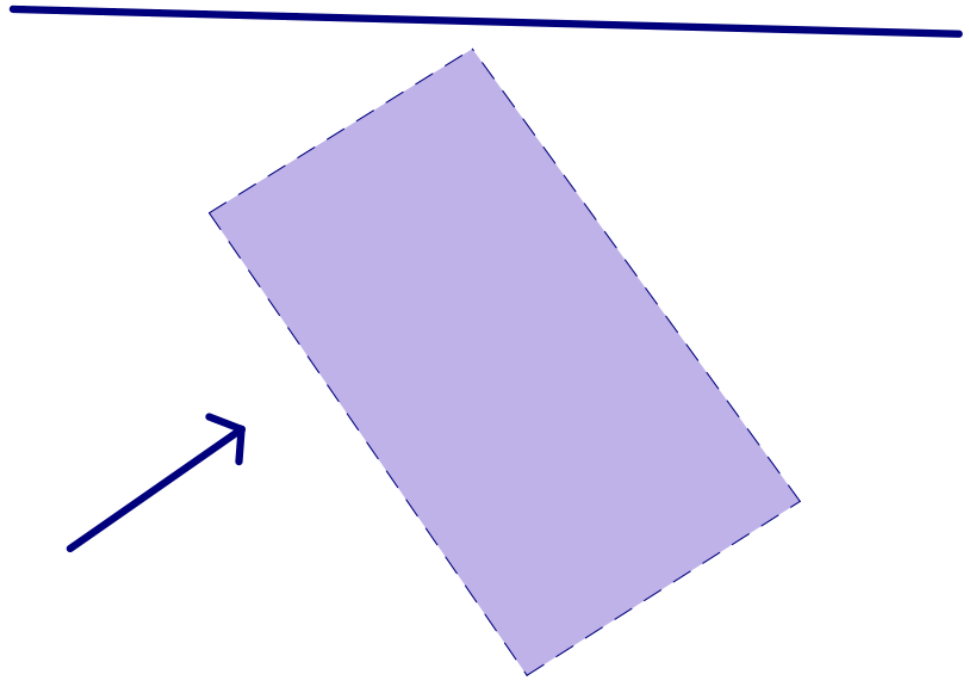
Math 2240: Introduction to Linear Algebra



- Linear Objects
- Linear Operations
- Critical analysis and creative inquiry: why / why not?
- Diverse perspectives and disciplines (alg, geom, computer, applications...)

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

Try it Out!

book readings
interactive videos
practice quizzes
handwrite practice
think-share-pair-compare

Review and Understand Misconceptions

feedback
re-engage solutions
debriefs
revise and reflect

Solidify and Make Connections

problem sets
in-class assessments
final project

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

Handwrites, begin assignments and major assignments have strict deadlines of 9:50am the next academic day. All other activities are those you should attempt for completion by then, but you'll have 2nd chances that remain open until closer to the corresponding in-class assessment. Some days are lighter than others and it will help you to progress on upcoming activities in advance, especially major assignments. Plan to spend 3.5–5 hours between classes, on average, as per the University-wide Statement on Student Engagement with Courses (while we don't meet synchronously for the third hour, its time in and out of class are a part of this computation).

	Class Tuesday	Between Classes (by 9:50am Thursday)	Class Thursday	Between Classes (by 9:50am Tuesday)
8/23–8/25	active learning handwrite course overview module 1 overview	2240 interactive video download Maple (free) access e-text 1.1 read the e-text 1.1 interactive video 1.1 practice quiz syllabus	1.1 handwrite, activities t-shirt Thursday	turn in 2 handwrites 1.2 read the e-text 1.2 interactive video 1.2 practice quiz Maple intro video practice submitting PDF add ASULearn profile pic Zoom update & profile pic
8/30–9/1	1.2 handwrite, activities	re-engage 1.1 handwrite turn in 1.2 handwrite 1.3 read the e-text 1.3 interactive video 1.3 practice quiz	1.3 handwrite, activities t-shirt Thursday	re-engage 1.2 handwrite turn in 1.3 handwrite 1.4 read the e-text 1.4 interactive video 1.4 practice quiz
9/6–9/8	1.4 handwrite, activities	re-engage 1.3 handwrite turn in 1.4 handwrite 1.5 read the e-text 1.5 interactive video 1.5 practice quiz	1.5 handwrite, activities t-shirt Thursday	re-engage 1.4 handwrite turn in 1.5 handwrite 1.7 read the e-text 1.7 interactive video 1.7 practice quiz **begin problem set 1**
9/13–9/15	1.7 handwrite, activities	re-engage 1.5 handwrite turn in 1.7 handwrite card sort 1 review 1 practice quiz	group review 1 t-shirt Thursday	re-engage 1.7 handwrite debrief 1.1–1.5, 1.7 **problem set 1**
9/20–	group debrief 1	re-engage problem set 1	2.1 handwrite, activities	turn in 2.1 handwrite

1.1 read Linear Algebra and its Applications

Mark as done

1.1 interactive video

To do: Receive a grade

1.1 practice quiz

To do: Receive a grade **To do:** Receive a pass grade

1.1 read Linear Algebra and its Applications

Mark as done

Mark 1.1 read Linear Algebra and its Applications as done

read 1.1 in the e-text *Linear Algebra and its Applications* by David Lay, Steven Lay, and Judi McDonald at the top of our ASULearn. I recommend taking notes on concepts and examples, especially relating to:

- algebra of linear equations: coefficients and variables
- geometry of linear equations in 2D and 3D: lines and planes
- solution set: inconsistent: 0 solutions; consistent: 1 unique solution or infinite solutions
- matrix of a linear system: coefficient matrix, augmented matrix, triangular form
- row equivalent systems
- algorithm for solving a linear system using elementary row operations of replacement, interchange, and scaling

Manually mark as done the box in ASULearn.

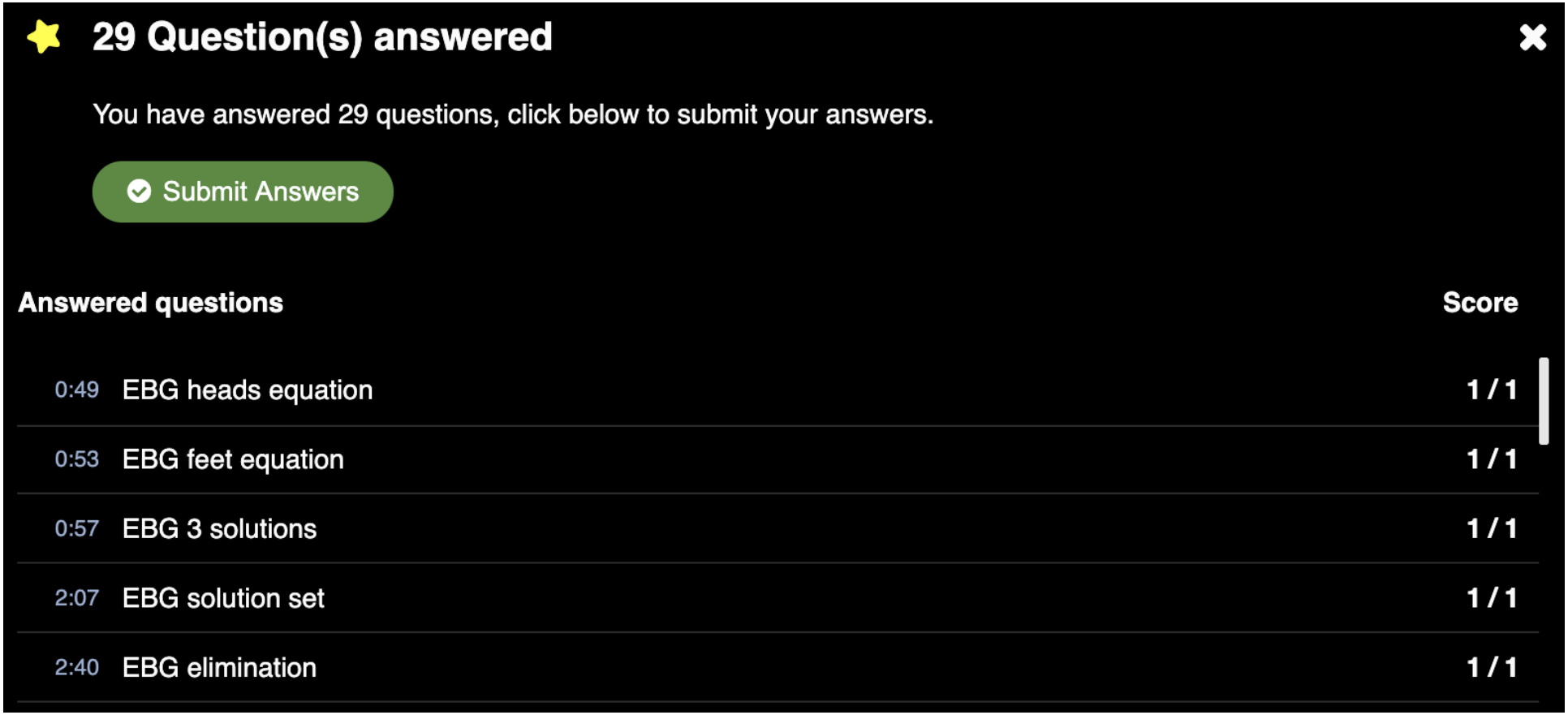
solutions

The solutions to a system of equations is a representation of the entire set of assignment of variables that makes all the equations (simultaneously) hold. A solution is one assignment, but may not represent them all, whereas the plural version "solutions" (ie the solution set) should. For instance if a matrix reduces to $\begin{bmatrix} 1 & 0 & -1 & 1 \\ 0 & 1 & 2 & 1 \\ 0 & 0 & 0 & 0 \end{bmatrix}$

then it has infinite solutions. One solution is (1,1,0), but to express all solutions: (1+t, 1-2t,t), as t varies over the reals, by parameterizing the free variable and then solving for the variables with pivots. This concept is first explored in 1.1 in the book.

OK

H5P interactive video activities, repeatable



2240 interactive video

Failed: Receive a grade

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download or access Maple (free) and open the program

Mark as done

My Materials

Mark as done

First, obtain your access code from My Materials. Then access the e-text *Linear Algebra and its Applications* at the top of ASULearn to enter or create your Pearson account info and enter the access code from the bookstore. If you have difficulty, you can access a PDF of the beginning of Chapter 1. Self-report the e-book access as complete here.

1.1 read Linear Algebra and its Applications

Mark as done

1.1 interactive video

To do: Receive a grade

1.1 practice quiz

To do: Receive a grade **To do:** Receive a pass grade

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policies & grades →syllabus

Mark as done

2240 interactive video

Done: Receive a grade

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download or access Maple (free) and open the program

✔ Done

My Materials

✔ Done

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1.1 read Linear Algebra and its Applications

✔ Done

1.1 interactive video

Done: Receive a grade

1.1 practice quiz

Done: Receive a grade **Done:** Receive a pass grade

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policies & grades →syllabus

✔ Done

Dr. Sarah's Linear Algebra Tentative Calendar Page - Fall 2022

The best way to contact me is during office hours or on the ASULearn need help forum, as I usually check the posts daily.

- syllabus and grading policies
- What is Due When?

Date	☐ **work is due by 9:50am**

Linear Systems of Matrix and Vector Equations

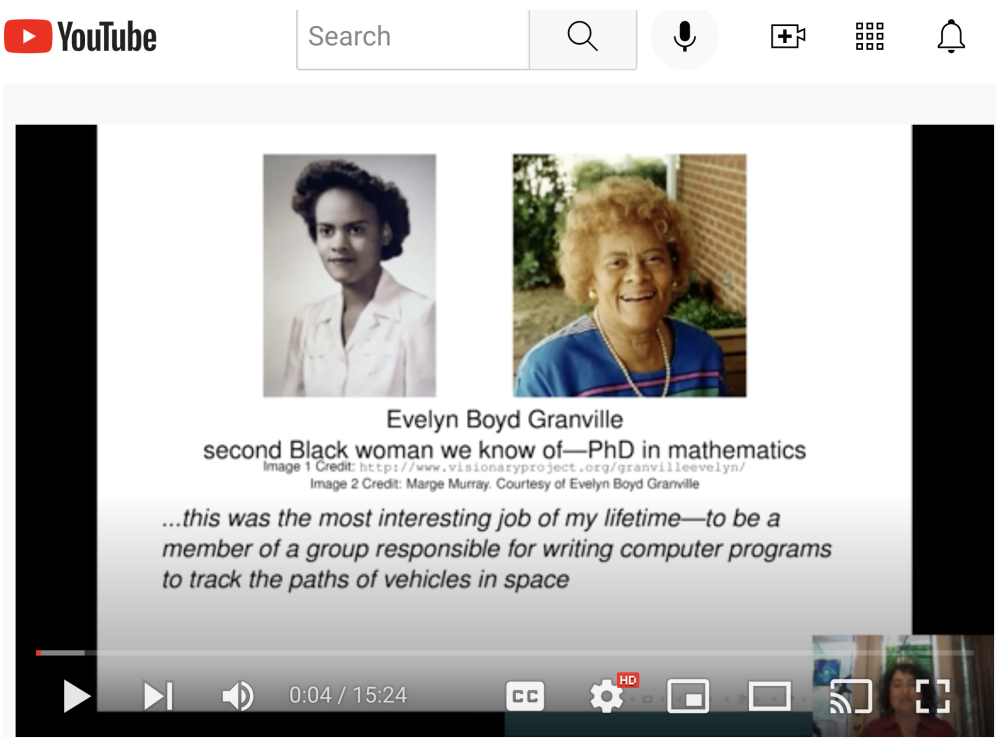
25 Aug - Thur

- ☐ 2240 interactive video
- ☐ download or access Maple (free) and open the program
- ☐ access the e-text
- ☐ 1.1 read *Linear Algebra and its Applications*
- ☐ 1.1 interactive video slides, Maple, Desmos, interactions
- ☐ 1.1 practice quiz
- ☐ syllabus

class: 1.1 handwrite, additional activities

23 Aug - Tues

class: course and module 1 overview, active learning handwrite and handout



practice with instantaneous feedback from me, repeatable **Instantaneous Feedback** opens after you **Check** a response, and then you can retake it if you wish. For a box where you enter the symbols, **hover over the box to see the feedback**.

3.14 ✗

Check

yes for all k ✗ look for k(s) that makes row 2 column 2 nonzero in Gaussian to have a pivot. So you have to eliminate two ks that give a missing pivot

only when $k = \pm 1$

only when $k \neq \pm 1$

other

The correct answer is: only when $k \neq \pm 1$

Part e) Does this system ever have infinitely many solutions, for a k?

yes

no ✓

The correct answer is: no

Part f) How many solutions are there for a k so that $k \neq \pm 1$? 0 ✗

Part g) How many solutions are there for a k so that

Incorrect
try again. you have full pivots

Summary of your previous attempts

Attempt	State	Points / 9.00	Grade / 100.00	Review
1	Finished Submitted Tuesday, April 27, 2021, 7:19 PM	7.66	85.16	Review

practice with instantaneous feedback from me, repeatable

True or False:

The solution set of a linear system involving variables $x_1, .., x_n$ is a list of numbers $(s_1, ..., s_n)$ that makes each equation in the system a true statement when the values $(s_1, ..., s_n)$ are substituted for $x_1, .., x_n$ respectively.

For true/false questions, the book instructs: if a statement is false, provide a specific counterexample. If it is true, quote a phrase and page number from the book.

- (•) True and I found a phrase and page number from the text ✗ it is false-write down a system that has infinite solutions and see how the part that reads "is a list of numbers" is a problem
- ( ) False and I can provide a counterexample
- ( ) other

Mark 0.00 out of 1.00

The correct answer is: False and I can provide a counterexample

Check

A system with infinite solutions would provide a counterexample, because the solution set would be all assignments of the numbers, not just one assignment of them that works. The problematic text here is "is a list of numbers"

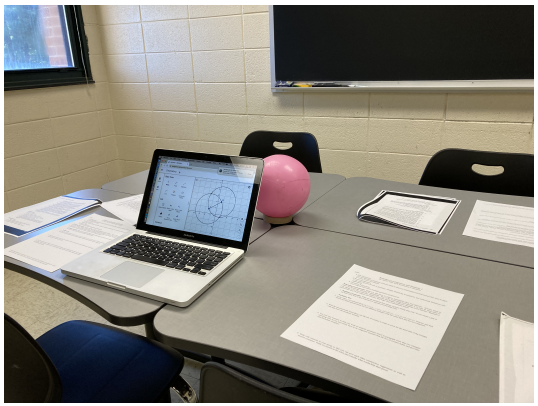
General Feedback

Avoid Becoming too Dependent on the Online System

Second Chance

In-class Activities

- 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



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

handwrite practice. Collate into one single PDF

Grade:

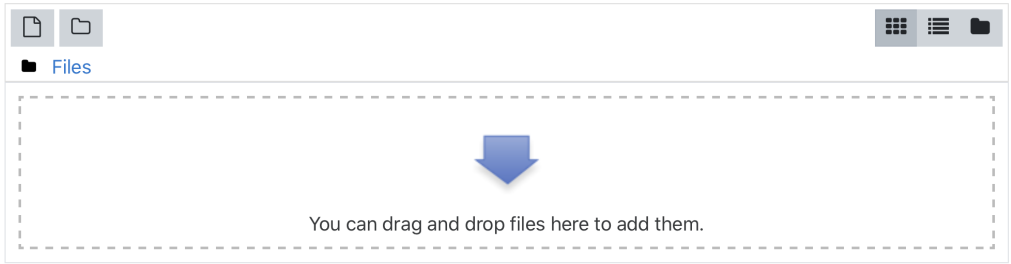
scale	Padawan (still training)	Jedi	Jedi Master	Good start but this is incomplete. See the attached file.

- Padawans are training to one day become a Jedi.
- Both Jedi and Jedi Master ratings earn completion.
- I'll respond with feedback on your PDF and re-engage solutions will also open

Add submission

You have not made a submission yet.

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

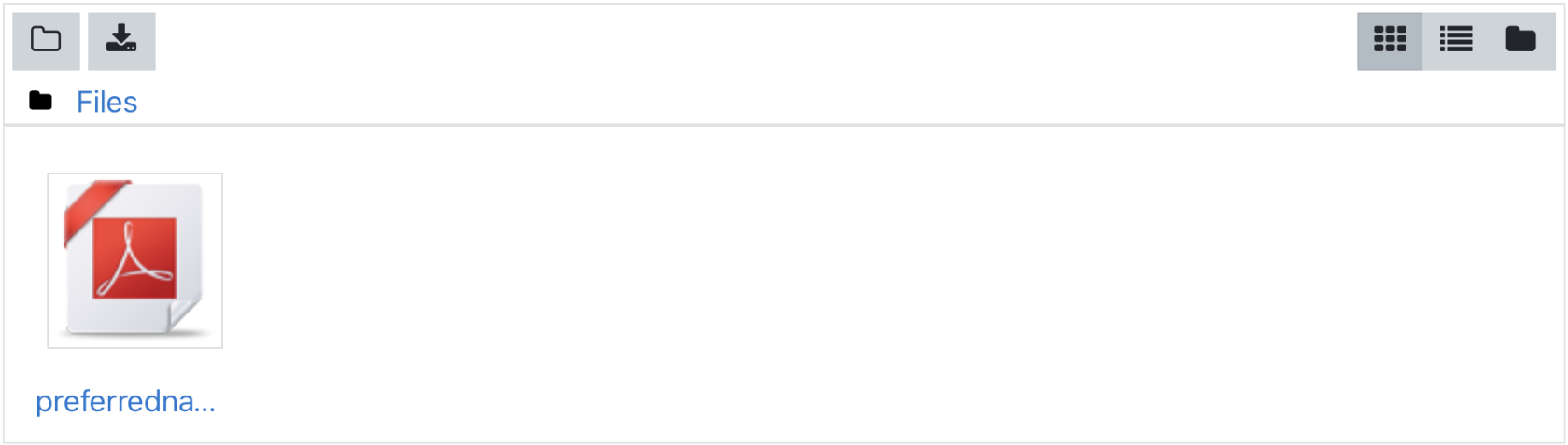


Accepted file types:

PDF document .pdf

Save changes Cancel

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



Accepted file types:

PDF document .pdf

Save changes Cancel

Edit submission | Remove submission

You can still make changes to your submission.

Feedback

Grade	
scale	Padawan (still training) | **Jedi** | Jedi Master — see the annotations.
	Jedi
Graded on	Sunday, August 2, 2020, 8:48 AM
Graded by	 Sarah Greenwald
Annotate PDF	Sarah Greenwald greenwaldsj_368046_0.pdfAugust 2 2020, 8:48 AM

begin major assignment or study guide

glossary

re-engage, debrief, surveys

begin problem set 1

To do: Submit feedback

Thur 9/15 by 9:50am

re-engage 1.5 handwrite

Restricted Not available unless any of:

- It is after **September 13 2022, 10:00 AM**
- The activity **turn in 1.5 handwrite** is complete and passed

turn in 1.7 handwrite

To do: Receive a grade

card sort 1

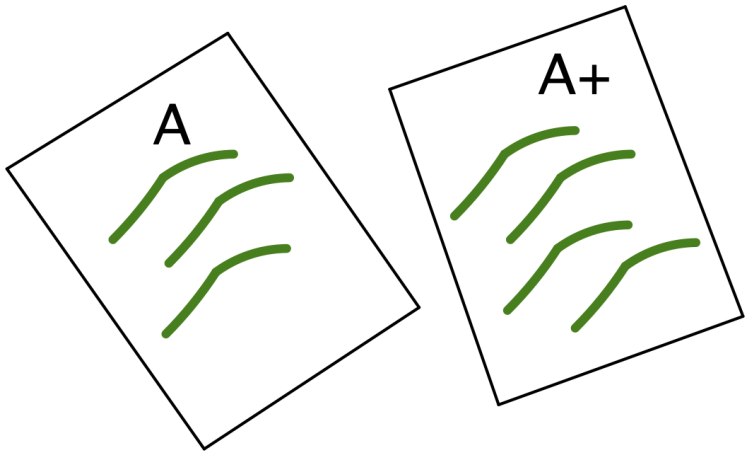
To do: Receive a grade

review 1 practice quiz

To do: Receive a grade **To do:** Receive a pass grade

Grades

- Effective ASULearn Engagement 35%
  try again, keep scrolling down, I'm here to help!
- Problem Sets 30%
- In-class Assessments 20%
- Final Project 10%
- Effective Class Engagement 5%



The grading scale is: $A \geq 93; 90 \leq A- < 93; 87 \leq B+ < 90...$

Material from MAT 1120

- algebraic solutions of linear equations
  partial fractions
- visualizations and equations of curves and surfaces and linear intersections in 2D and 3D
  rectangle and box slicing, both visually and algebraically
- limits applied to diverse objects
  like improper integrals and partial sums of series
- sin and cos trigonometry
  trig substitution
- linear approximations
  Taylor polynomial of degree 1, Euler's method, and slope field
- mathematical reasoning and justifications
  algebraic, numerical, and geometric reasoning, including computer algebra software like Maple

Zoom check-in for help on activities

 Dr. Sarah's e-Z check-in (internet allowing)

Sunday, Monday, Wednesday 7–7:50pm
Tuesday, Thursday 1:15–2:30pm
drop in—no appointment needed—I want to hear how you are doing!

Where to Get Help Outside of Class

- Zoom
- need help from me, math dept tutoring, your classmates, or tech support forum
- use my instant feedback and personalized feedback to help you learn keep scrolling down
- `https://sites.google.com/appstate.edu/mat-2240-syllabus-f22/student-advice`

I care about you and your success!

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

Do you have time for this course?