

Math 225 lecture 20 Oct 28<sup>th</sup> 2023

(1)

Goal: outline the format & content of the midterm  
discuss study strategies & effective use of time.

Class Q: How do you study for exams? does it work for you? what changes to that strategy do you make based on time?

Midterm info:

- ~~Format~~ - book keeping - no books / notes / calculators
- scrap paper provided
- electronic marking only write on the front of each page
- if you have questions ASK!

- I won't be asking you to prove or reproduce any proofs on the midterm

Format - 3 long answer

- each out of 10
- show work
- make your answers clear
- focused on skills
- 5 MC
  - 2 marks each NO part marks
  - 1 correct answer (if you mark more than 1 is wrong)
  - 7 answers per if not sure guess.
  - concept focused.
  - read carefully lots of NOT's

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ideally you have 10 minutes per long answer, 15 for the MC & 5 to spare to look over things (scaled up appropriately)

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(2)

How do you study for a math exam? (brief discussion)

Here is my process

Step 1: the list, figure out everything you've learned in the course, what is the possible list of things to know.

- solving systems of linear equations
- subspaces
  - row space
  - column space
  - null space
- determinants
- complex #'s
- eigen stuff
  - e. vals
  - e. vcts
  - e. spaces
- Markov matrices
- abstract vector spaces
- \* - orthogonality
  - \* -  $C-S$  \*
  - QR factorization
  - orthogonal complements
  - Projections
- \* - least squares solutions
  - direct method
  - QR method
- \* - normal system \*
- singular value decomposition.
- \* - orthogonal diagonalization of symmetric matrices

be as exhaustive as possible. you can break up / subdivide as many or few of these as you would like / need.

for each skill ideally know the  $\rightarrow$ , when it can be applied & how to do it.

additionally writing your own list of definitions ~~etc~~ ~~etc~~ properties and when those can be applied is great.

\* important topics (usually judged from emphasis & time)



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## Step 2: Numbering

go through each topic and rate them from 1-3

1's: these are concepts you know, understand and can execute consistently. all but the very hardest of examples you can do even on a bad day.

2's: these are concepts you got part of, you understand the basics, you can complete easy and some moderate to challenging examples on a good day. (this is where most of your time will be spent)

3's: these concepts you are completely lost on you catch only the most basic of examples on a good day, they are over your head.

## IMPORTANT NOTES

- be honest/realistic
- do not fall into the trap of spending all your time on your 3's
- your time is limited use it well.

## Step 3: study!

at this stage I split my studying time roughly as follows

#	% of time	assuming limited time.
1's	20 %	
2's	60 %	
3's	10 %	

Mishra



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why?

we study & do some questions for the 1's as a sanity check. Make sure we are right about them

we spend most of our time on 2's because that is where we make up the most ground in the least time. it's easier to make a 2 into a 1 than a 3 into a 1 or 2.

pick one important three & try to get it over the line most times you don't have time for much more than one or two of them to truly improve.

when am I ready?

for me if 75% of the material are 1's 20% are ~~2's~~ 2's & 5% are 3's this usually yields a solid mark because if the exam is distributed evenly across all topics & you get say 65-70 of the 75% which are 1's half (so 10 out of 20) of the ~~2's~~ 2's & none of the ~~3's~~ 3's you end in the 80% range which is ~~pre~~ pretty good. adjust according to your goals.

★ in addition review the definitions / properties in ~~the~~ throughout. in this case the MC will focus on these pieces of conceptual understanding. ★



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## Disclaimer

this is my own personal system it has its advantages & drawbacks and your mileage may ~~vary~~ vary take from it what you want & discard what you don't

## additional tips/tricks/strategies

- Flashcards are great!
- do what you know on the exam first
- if you are unsure on a problem leave it & come back
- **READ CAREFULLY!**
- ask if you have a question.