

Math 225 lecture 34 Dec 4<sup>th</sup> 2023

①

Goal: review studying habits, outline the final exam, discuss content for the final & give class time for SPOT surveys.

Class Q: How will the experience of the midterm impact your studying for the final?

Today! - discuss what content from last week is valid for the final

- cover format & approx q count
- review studying strategies
- the big list of things to know
- time for spot surveys

- 15 min break to complete spot surveys (we leave room)

format (approximate at this time for Q counts)

same as midterm

- no books/notes/calculator etc.
- scrap provided
- only write on designated pages
- if you have questions ask.

about 6 long answer  $\pm 1$

- out of 10
- show work
- make sure your answers are clear
- skid focused.

(2)

- 10 MC  $\pm 2$ 
  - 2 marks each
  - no part marks
  - 1 correct answer (please be clear!)
  - 7 answers per Q
  - concept focused
  - read carefully
  - Guess if you don't know!!!
- like before try to find your study habits I like the 1-2-3 system (see midterm review notes, Oct 23<sup>rd</sup> for details)

Differences from the midterm, No promises about proofs however, all definition based and algorithmic (think assn question to verify that  $X$  is a      style of thing)

from last week

<u>need to know</u>	<u>don't need to know</u>
<del>is a graph</del> <del>basic definition</del> <ul style="list-style-type: none"><li>- basic definitions like, graph, connected, path, etc.</li><li>- definition of spectral radius</li><li>- how to build an adj. matrix <math>A_G</math></li><li>- condition for graph isomorphism</li></ul>	<ul style="list-style-type: none"><li>- alternative definitions, digraph, multigraph, subgraph, etc.</li><li>- path counting (my error, if we won't cover it)</li><li>- proofs of any kind from this section</li><li>- all extraneous content from Friday not mentioned to the left.</li></ul>



③

"The list" again not necessarily exhaustive but pretty close!

- systems of linear equations
- subspaces
  - row/col/null space
- determinants
- complex #'s
- eigenstuff
  - values, vectors & spaces
- Markov matrices
- abstract v. spaces
- orthogonality
  - G-S
  - QR factorization
  - orth. complements
  - projections
  - orth diagonalization
- Least squares solutions (LSS)
  - direct
  - QR
  - normal system
- Invertibility
- Change of basis
  - $P_D \leftarrow B$
  - diagonalization
  - outside of  $\mathbb{R}^n$
- Inner products (& their spaces)
  - definitions / properties
  - norm / distance / orthogonal
  - projections
- Graph theory
  - only what's discussed above

For each topic ideally you will know definitions, basic properties, & ~~the~~ the related computations you can do with it

### Singular value decomposition (SVD)

- Linear transformations
  - definition of linearity
  - $[T]_{D \leftarrow B}$
  - composition
  - coordinate vectors  $[\vec{v}]_B$
  - basis
  - Kernel / range
  - one-to-one / onto