MATH 341
MIDTERM 2 REVIEW

INSTRUCTOR: ROBERT LIPSHITZ

The format and length of the second midterm will be similar to the first, except there will be some true / false questions on it. Here is a list of textbook problems similar in scope and difficulty to the second midterm, to use as review. (This list is longer than the midterm itself.)

- §2.2: Find the inverse of $\begin{bmatrix} -1 & -1 & 1 & -3 \\ -1 & -2 & 2 & -2 \\ 0 & 3 & -2 & 2 \\ 0 & -4 & 3 & 0 \end{bmatrix}$.
- §2.5: 11, 18
- §2.8: 23, 29
- §2.9: 6, 9
- Supplementary exercises p. 162: 6, 8, 9
- §3.1: 9
- §3.2: 8, 39
- Indicate whether each statement is true or false. If true, give a one sentence explanation of why. If false, give an example to show it is false (i.e., a counterexample).
  (a) If $AB = AC$ and $\det(A) = 7$ then $B = C$.
  (b) If A is a 4×4 matrix and the row-reduced echelon form of A has 3 pivots then $\det(A)$ is non-zero.
  (c) If a linear transformation T is onto then the standard matrix for T has at least as many rows as columns.
  (d) If a linear transformation T is one-to-one then the standard matrix for T has at least as many rows as columns.
  (e) If A is a 3×3 matrix and the equation $A\vec{x} = \begin{bmatrix} 1 \\ 2 \\ 3 \end{bmatrix}$ has infinitely many solutions then $\det(A) \neq 0$.
  (f) If A is a 3×3 matrix and the equation $A\vec{x} = \begin{bmatrix} 1 \\ 2 \\ 3 \end{bmatrix}$ has exactly one solution then A is invertible.
  (g) If A is a 4×4 matrix and the null space of A is 3-dimensional then the column space of A is 2-dimensional.
  (h) If A is a 4×4 matrix and the row space of A is 3-dimensional then the column space of A is 3-dimensional.

Email address: lipshitz@uoregon.edu