Math 254 Exam 7b: 11/7/6

Please read the exam instructions.

Notes, books, papers, calculators and electronic aids are all forbidden for this exam. Please write your answers on **separate paper**, indicate clearly what work goes with which problem, and put your name on every sheet. Cross out work you do not wish graded; incorrect work can lower your grade, even compared with no work at all. Keep this list of problems for your records. Show all necessary work in your solutions; if you are unsure, show it. Extra credit may be earned by handing in revised work in class on Thursday 11/9; for details see the syllabus. Each problem is worth 10 points. You have approximately 30 minutes.

- 1. Carefully define the Linear Algebra term "dependent". Give two examples in \mathbb{R}^2 .
- 2. Carefully define the term "orthonormal". Give two examples in \mathbb{R}^2 .
- 3. Let u = (2, 0, -3), a vector in \mathbb{R}^3 . Find $||u||_1, ||u||_2, ||u||_3, ||u||_{\infty}$.
- 4. For the vector space \mathbb{R}^4 , set $v_1 = (1, 1, 1, 1), v_2 = (1, 1, 2, 4), v_3 = (1, 2, -4, -3), S = \operatorname{span}\{v_1, v_2, v_3\}$. Find an orthogonal basis for S.
- 5. For the vector space \mathbb{R}^3 , set $T = \text{span}\{(1,2,3)\}$. Find an orthogonal basis for T^{\perp} .