

Midterm #1 description

Math 152, Spring 2017

Format:

- In class, 50 minutes
- Wednesday, February 8 or Thursday, February 9
- Attend the section in which you are registered
- No calculators, No notes
- Worth 15% of your final mark
 - part A: 10 short questions worth 1 mark each
 - part B: 3 long questions worth 5 marks each
 - total 25 marks

Material:

- Theory: vectors, vector addition and scalar multiplication, lines and planes in 2D and 3D, geometry of solutions to linear systems, linear dependence and independence, linear combinations, basis, row echelon form and reduced row echelon form, rank, homogeneous systems.
- Techniques: lengths, dot product, projections, determinants (2×2 and 3×3), cross products, writing linear systems in augmented matrices, solving linear systems with Gaussian Elimination and Backward Substitution, MATLAB.

Details:

- Material from WeBWorK assignments #1-4.
- MATLAB commands from labs #1 and #2.
- Material from the online notes, Chapter 2 (not including additional material) and Chapter 3, sections 3.1-3.4.

We guarantee a question on the exam of the following type (with the numbers changed):

B1: Consider the linear system for the unknowns x , y and z :

$$\begin{aligned}x + 2y + 3z &= 9 \\x - y + 2z &= 9 \\x + 4y + 9z &= 25\end{aligned}$$

- (a) [1 mark] Write the system in an augmented matrix.
- (b) [3] Do row operations (Gaussian elimination) on the augmented matrix to change it to upper triangular form.
- (c) [1] Find the solution to the problem using backward substitution from the form above. *Note:* this system has a unique solution.