Math 2605, **Review Topics and Problems for the Final Exam**, Part 1

1. Parametric (explicit) and equational (implicit) presentation of lines and planes: CAR Chapter 0, p.0-19, 3; Quizzes 1, 2; Exam 1a(1,2), 1b(1).

2. Decomposition of a vector into the parallel and orthogonal parts with respect to another vector, reflections, distances (point to line, point to plane), distance between two lines: CAR Chapter 0, p.0-19, 5, 6, 8; p.0-24, 1; Quiz 2, Exam 1a(3), 1b(2).

3. Vector functions, functions of many variables, partial derivatives, gradient, level sets, tangent to a level set: CAR Chapter 1, p.1-27, 4, 10; p.1-41, 1; p.1-54, 2; Quizzes 3, 4, 5.

4. Critical points, Hessian, local minima and maxima: CAR Chapter 1, p.1-64, 1; Quiz 5; Exam 1a(4), 1b(4).

5. Optimization with constraints, Lagrange's method: CAR Chapter 1, p.1-126, 1,4.