

Final Review Sheet

MATH 120

Prof. Janet Vassilev

December 5, 2007

1. Test format:
 - Question 1 True-False (10 on definitions and theorems)
 - Question 2, 3, 4 and 5 Short answer (on definitions and theorems)
 - Question 6, 7, 8, 9 and 10 Computational (like homework at least part of the process with regards to the simplex method.)
 - Question 11 and 12 Proofs
2. Know all homework problems: Computational problems and proof may be similar (books, notes, calculators and working cell phones not allowed at the test).
3. Definitions to know: Linear Transformation, Similar Matrix, Eigenvalue, Eigenvector, Symmetric Matrix, Complex Inner Product, Orthogonal Projection, Range (Image), Nullspace (Kernel), Quadratic Form, Positive (Semi)Definite, Negative (Semi)Definite, Principal Minor, Leading Principal Minor, Matrix norm, Matrix norm compatible with a vector norm, line segment, hyperplane, half space, linear variety, convex set, neighborhood (ϵ -ball), interior, boundary, open set, closed set, convex polytope, convex polyhedron, affine function, differentiable function, the derivative, the Hessian, level set, tangent hyperplane, big O and little o, feasible direction, feasible point, feasible set, regular point, curve, tangent space, normal space, lagrangian function, the Lagrange condition, active constraint, inactive constraint, index of active inequality constraints, standard form of a linear program, surplus variable, slack variable, basic solution, degenerate basic solution, basic feasible solution, degenerate basic feasible solution, optimal feasible solution, optimal basic feasible solution, extreme point of a constraint, canonical augmented matrix, pivot equations, reduced cost coefficient, tableau for a LP problem, canonical tableau for a LP problem, artificial problem, revised tableau, primal problem, dual problem, symmetric duality, asymmetric duality
4. Theorem statements to know: Sylvester's Criterion, Rayleigh's Inequality, Properties of Convex sets, the chain rule, Taylor's Theorem, FONC, SONC, SOSC, Lagrange's Theorem, Karush Kuhn Tucker Theorem, the fundamental theorem on linear programming, simplex algorithm, two phase simplex algorithm, revised simplex algorithm, weak duality lemma, the duality theorem.
5. In addition to the homework proofs, you should know how to prove the following theorems: Theorem 3.2, Theorem 3.3, Theorem 3.8, Theorem 4.1, Theorem and Corollary 6.1, Theorem 6.2, Theorem 6.3, Theorem 15.1, Theorem 15.2, Proposition 16.1.