

Midterm Review Sheet

MATH 120

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1. Test format:
 - Question 1 True-False (5 on definitions and theorems)
 - Question 2 and 3 Short answer (on definitions and theorems)
 - Question 4 and 5 Computational (like homework)
 - Question 6 A Proof
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
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
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