Review For MAT 365 Test 1

Definitions of the words in **boldface** may be asked on the exam.

1.1 subspace, vector field, vector, point, standard basis
Sample Problems: Example 1.1.6 Exercise 1.1.16

1.2 matrix, matrix multiplication, **identity matrix, inverse of a matrix, transpose of a matrix, symmetric matrix** triangular matrix, diagonal matrix
Propositions/Theorms to know and be able to use: 1.2.9, 1.2.14,,1.2.17
Sample Problems: Proposition 1.2.15, Exercise 1.2.12

1.3 linear transfromation, transformations: identity, rotation scaling, stretching
Propositions/Theorms to know and be able to use: 1.3.4, 1.3.14
Sample Problems: Exercise 1.3.4, 1.3.7

1.4 dot product, length of a vector, length of a matrix,cross product angle between two vector(1.4.6),determinant
Propositions/Theorms to know and be able to use: 1.4.5, 1.4.8,1.4.11
Sample Problems: be able to prove Theorem 1.4.9, Exercise 1.4.21

1.5 open set,closed set, closure, interior, boundary, convergence,subsequence, **limit of a function, continuity**, uniform continuity, complex exponential
Propositions/Theorms to know and be able to use:1.5.13-1.5.17, 1.5.21-1.5.24, 1.5.27-1.5.30, 1.5.36-1.5.38
Sample Problems: be able to prove Theorem 1.5.32, Example 1.5.25

1.6 supremum, maximum, infimum, minimum
Propositions/Theorms to know and be able to use:1.6.9, 1.6.11, 1.6.12, 16.13

1.7 derivative of a map from $\mathbb{R}^n$ to $\mathbb{R}^m$, Jacobian matrix
Propositions/Theorms to know and be able to use:1.7.9, 1.7.11, 1.7.14, 1.7.19
Sample Problems: Examples 1.7.15, 1.7.16, 1.7.17, Exercise 1.7.11

1.8 product rule 1.8.1-5, chain rule 1.8.3 Propositions/Theorms to know and be able to use: 1.8.1-1.8.3
Sample Problems: Examples 1.8.4,1.8.5,1.8.6, Exercise 1.8.4

1.9 continuously differentiable function, C^p function
Propositions/Theorms to know and be able to use:
Sample Problems: be able to prove Theorem 1.9.1

2.1 2.2 (reduced) echelon form, row operations, pivot column, pivot variable, nonpivot column, nonpivot (free) variable
Propositions/Theorms to know and be able to use: 2.2.2
Sample Problems: Examples 2.1.3 ,2.2.4, Exercise 2.2.2

2.3 inverse of a matrix
Propositions/Theorms to know and be able to use:2.3.1
Sample Problems: example 2.3.4 Exercise 2.3.3, 2.3.5

2.4 linearly independent,linear combination, span, basis, orthonormal basis, dimension of a subspace
Propositions/Theorms to know and be able to use:2.4.11
Sample Problems: be able to prove Theorem 2.4.17, Exercise

2.5 kernel, image, rank
Propositions/Theorms to know and be able to use:2.5.2, 2.5.3, 2.5.4, 2.5.6, 2.5.8
Sample Problems: Exercise 2.5.6, 2.5.9