

LINEAR ALGEBRA

by

Alexander Givental



Sumizdat

Contents

1 Introduction	1
1 Vectors in Geometry	3
2 Complex Numbers	11
3 A Model Example: Quadratic Curves	21
4 Problems of Linear Algebra	29
2 Dramatis Personae	39
1 Vector Spaces	39
2 Matrices	57
3 Determinants	71
4 Tensors	89
3 Simple Problems	101
1 Rank	101
2 Gaussian Elimination	109
3 The Inertia Theorem	122
4 The Minkowski–Hasse Theorem	134
4 Eigenvalues	141
1 The Spectral Theorem	141
2 Euclidean Geometry	153
3 Jordan Canonical Forms	169
4 Linear Dynamical Systems	181
Epilogue: Quivers	193
Hints	207
Answers	213
Index	219