1. Linear Algebra Data Structures
2. Tensor Operations
3. Matrix Properties
4. Eigenvectors and Eigenvalues
5. Matrix Operations for Machine Learning
6. Limits
7. Derivatives and Differentiation
8. Automatic Differentiation
9. Partial-Derivative Calculus
10. Integral Calculus

Matrixs property

1. Frobenius Norms;

||X||f = ʃƩi,j Xi,j2

2. Matrix Multiplication:

3 4 1 3\*1 + 4\*2 3+8 11

Matrixs \* vector

5 6 2 = 5\*1 + 6\*2 = 5+12 = 17

7 8 7\*1 + 8\*2 7+16 23

3 4 1 9 3\*1+4\*2 3\*9+4\*0 11 27

5 6 2 0 = 5\*1+6\*2 5\*9+6\*0 = 17 45

Matrixs \* Matrixs

7 8 7\*1+8\*2 7\*9+8\*0 23 63