

## Contents

0.1	Properties of determinants . . . . .	1
0.1.1	Identity . . . . .	1
0.1.2	Multiplication . . . . .	1
0.1.3	Inverse . . . . .	1
0.1.4	Complex conjugate . . . . .	1
0.1.5	Transpose . . . . .	1
0.1.6	Addition . . . . .	2
0.1.7	Scalar multiplication . . . . .	2
0.1.8	Determinants and eigenvalues . . . . .	2

### 0.1 Properties of determinants

#### 0.1.1 Identity

$$\det I = 1$$

#### 0.1.2 Multiplication

$$\det(AB) = \det A \det B$$

#### 0.1.3 Inverse

$$\det(M^{-1}) = \frac{1}{\det M}$$

We know this because:

$$\det(MM^{-1}) = \det I = 1$$

$$\det M \det M^{-1} = 1$$

$$\det(M^{-1}) = \frac{1}{\det M}$$

#### 0.1.4 Complex conjugate

$$\det(M^*) = \overline{\det M}$$

#### 0.1.5 Transpose

$$\det(M^T) = \det M$$

### **0.1.6 Addition**

$$\det(A + B) = \det A + \det B$$

### **0.1.7 Scalar multiplication**

$$\det cM = c^n \det M$$

### **0.1.8 Determinants and eigenvalues**

The determinant is equal to the product of the eigenvalues.