Exercise Sheet 5: Matrix Operations Cheat Sheet Template

Introduction

In linear algebra, matrices are fundamental mathematical objects used to represent linear transformations and systems of linear equations. Understanding basic matrix operations is essential for various applications in mathematics, physics, engineering, and computer science.

This cheat sheet provides a quick reference for basic matrix operations, including addition, subtraction, scalar multiplication, matrix multiplication, and transpose.

1 Matrix Operations Cheat Sheet

This cheat sheet provides a quick reference for basic matrix operations.

1.1 Example Problem

Let $A = \begin{pmatrix} 2 & 3 \\ 4 & 5 \end{pmatrix}$ and $B = \begin{pmatrix} 1 & 2 \\ 3 & 1 \end{pmatrix}$. Find $A - B$.

Solution

Given matrices A and B, we subtract B from A element-wise to obtain the result:

$$A - B = \begin{pmatrix} 2 & 3 \\ 4 & 5 \end{pmatrix} - \begin{pmatrix} 1 & 2 \\ 3 & 1 \end{pmatrix} = \begin{pmatrix} 2-1 & 3-2 \\ 4-3 & 5-1 \end{pmatrix} = \begin{pmatrix} 1 & 1 \\ 1 & 4 \end{pmatrix}.$$