MATH 257

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Contents

Chapter 1

MATH 257

My laptop died and I skipped some lectures to go to a part time job fair but I know every basic thing about matrices and vectors so I should be fine

Chapter 2

Column Vectors and Basis Vectors

If you take the columns of a vector, then you get a couple vectors that span a space.

Solving a linear system is the same as finding the linear combinations that equal a certain result

2.1 Matrix Vector Multiplication

$$\begin{bmatrix} c_1 & c_2 & c_3 \end{bmatrix} \begin{bmatrix} a \\ b \\ c \end{bmatrix} = ac_1 + bc_2 + cc_3$$

2.2 Transformations

You can multiply a vector by a matrix to transform it in a certain way

2.2.1 Rotation

$$\begin{bmatrix} \cos\theta & -\sin\theta \\ \sin\theta & \cos\theta \end{bmatrix}$$

2.3 3d Rotation Matrix

the way to figure out transformations is just to think about how the matrix transforms the 3 unit vectors

$$\begin{bmatrix} 1 \\ 0 \\ 0 \end{bmatrix} \rightarrow \begin{bmatrix} \cos\theta \\ \sin\theta \\ 0 \end{bmatrix}$$

$$\begin{bmatrix} 0 \\ 1 \\ 0 \end{bmatrix} \rightarrow \begin{bmatrix} \cos\theta \\ \sin\theta \\ 0 \end{bmatrix}$$

$$\begin{bmatrix} 0 \\ 0 \\ 1 \end{bmatrix} \rightarrow \begin{bmatrix} \cos\theta \\ \sin\theta \\ 0 \end{bmatrix}$$