

Math 241 F1H: Problem Set 1

Due date: In class on Wednesday January 23.

Problems from Lovric's *Vector Calculus*.

§1.1: #1, 2, 8, 9, 14.

§1.3: #6, 10, 11, 14, 15, 21, 26.

§1.4: #14, 15.

N1: Consider the matrices

$$A = \begin{pmatrix} 1 & -1 \\ 1 & 1 \end{pmatrix} \quad B = \begin{pmatrix} 1 & 1 \\ 0 & 1 \end{pmatrix}$$

Describe the actions of the two linear transformations F_A and F_B .

N2: For the matrix

$$A = \begin{pmatrix} 0 & 0 & 1 \\ 1 & 0 & 0 \\ 0 & 1 & 0 \end{pmatrix}$$

the corresponding linear transformation $F_A: \mathbb{R}^3 \rightarrow \mathbb{R}^3$ is a rotation about a certain line L . Find L and the angle through which F_A rotates.