22A Homework 8

Due Friday May 25, 5pm Wellman Boxes

HILLMAN $\equiv$ Kolman/Hill, Edition 8, "*Introductory Linear Algebra*"

Question 1 Suppose P is a non-singular $n \times n$ matrix and $\mathbf{e_1}, \ldots, \mathbf{e_n}$ is a basis for $\mathbb{R}^n$. Prove that $P\mathbf{e}_1, \ldots, P\mathbf{e_n}$ is also a basis.

Question 2 Write down a 3×3 matrix that *cannot* be diagonalized.

Question 3 Suppose the matrix A is similar to

$$D = \begin{pmatrix} \alpha & 0 & 0 \\ 0 & \beta & 0 \\ 0 & 0 & \gamma \end{pmatrix} .$$

Compute

$$\det(\exp A) .$$

Question 4 HILLMAN 6.5, pp 327-328, qq 2, 4, 16, 20, 22, 26, 28.

Question 5 HILLMAN 6.5, pp 328, qq T2, T4.

Question 6 HILLMAN 8.2, pp 431-432, qq 2, 4, 8, 10, 12, 16, 20, 24, 28, 30, 36, 37, 40, 41, 45, 46.

Question 7 HILLMAN 8.2 p 432, qq T2, T4, T6, T7, T8, T10, T12.

Question 8 HILLMAN 6.8 p 359, qq 2, 4, 6, 8, 10, 12, 16, 20.

Question 9 HILLMAN 6.8, pp 359-360, qq T1, T2, T4, T6, T8.