

Please complete following homework.

1. [FIS P84 2 (c) (d) (f)].
2. [FIS P84 3].
3. [FIS P85 10].
4. [FIS P96 3].
5. [FIS P97 4 (a) (b)].
6. [FIS P97 12].
7. We define the linear transformation $T_\theta : R^2 \rightarrow R^2$ to be rotation counter-clockwise about the origin through angle θ . Let T_x be the transformation that reflects in the x-axis.
 - (a) Write down the matrices of T_θ and T_x with the respect to the standard basis $\beta = \{e_1, e_2\}$ for R^2 . Hint: refer to the notes for T_θ .
 - (b) Show that for $\theta \in (0, \pi) \cup (\pi, 2\pi)$ one has $T_x T_\theta \neq T_\theta T_x$. This suggests that linear maps are usually not commutable.
 - (c) Next, show that there is some angle ψ such that $T_x T_\psi = T_\theta T_x$. What is the relationship between θ and ψ ? Discuss the geometric meaning of this computation.