Exercise 8.8. Compute a real logarithm for

$$\begin{pmatrix} -1 & 0 \\ 0 & -1 \end{pmatrix}$$

and show that

$$\begin{pmatrix} -1 & 1 \\ 0 & -1 \end{pmatrix} \quad \text{and} \quad \begin{pmatrix} -2 & 0 \\ 0 & -\frac{1}{2} \end{pmatrix}$$

do not have a real logarithm.