

Turn in #4

Let $R = M_2(\mathbb{R})$ the ring of 2×2 real matrices, and let I be an ideal of R .

Given that

$$\begin{bmatrix} 1 & 0 \\ 0 & 0 \end{bmatrix} \begin{bmatrix} 0 & 1 \\ 0 & 0 \end{bmatrix}$$
$$\begin{bmatrix} 0 & 0 \\ 1 & 0 \end{bmatrix} \begin{bmatrix} 0 & 0 \\ 0 & 1 \end{bmatrix}$$

belong to R , if $A = \begin{bmatrix} a & b \\ c & d \end{bmatrix}$ is a non-zero element of I , show that $I = R$.

[10 points]