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3. $\mathbf{M} = \begin{pmatrix} 3 & 1 & p \\ 1 & 1 & 2 \\ -1 & p & 2 \end{pmatrix}$ where p is a real constant

(a) Find the exact values of p for which $\mathbf{M}$ has no inverse.

(4)

Given that $\mathbf{M}$ does have an inverse,

(b) find $\mathbf{M}^{-1}$ in terms of p.

(5)

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