2. **In this question you must show all stages of your working.**
Solutions relying entirely on calculator technology are not acceptable.

$$\mathbf{A} = \begin{pmatrix} k & 0 & 0 \\ 4 & 2 & 3 \\ 1 & 3 & 4 \end{pmatrix}$$

where k is a constant.

(a) Find, in terms of k, the determinant of $\mathbf{A}$

(1)

(b) Hence determine, in terms of k, the matrix $\mathbf{A}^{-1}$

(3)

Given that

- $k = 1$
- the matrix $\mathbf{B}$ satisfies $\mathbf{AB} = \mathbf{A}^{\mathrm{T}}$

(c) determine the matrix $\mathbf{B}$

(3)

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Question 2 continued

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Question 2 continued

(Total for Question 2 is 7 marks)