1. $\mathbf{A} = \begin{pmatrix} 2 & 4 \\ 3 & 1 \end{pmatrix}$ $\mathbf{B} = \begin{pmatrix} 1 & k \\ 5 & 3k \end{pmatrix}$

where k is a constant.

Given that

$$\mathbf{C} = 3\mathbf{A} + 2\mathbf{B}$$

(a) determine $\mathbf{C}$ in simplest form in terms of k.

(2)

(b) Hence determine the value of k for which $\mathbf{C}$ is singular.

(3)

Given that $\mathbf{C}$ is non-singular,

(c) determine $\mathbf{C}^{-1}$ in simplest form in terms of k.

(2)

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Question 1 continued

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Question 1 continued

(Total for Question 1 is 7 marks)