1. (i) The matrix **A** is defined by

$$\mathbf{A} = \begin{pmatrix} 3k & 4k-1 \\ 2 & 6 \end{pmatrix}$$

where k is a constant.

(a) Determine the value of k for which **A** is singular.

(2)

Given that **A** is non-singular,

(b) determine $\mathbf{A}^{-1}$ in terms of k, giving your answer in simplest form.

(2)

(ii) The matrix **B** is defined by

$$\mathbf{B} = \begin{pmatrix} p & 0 \\ 0 & q \end{pmatrix}$$

where p and q are integers.

State the value of p and the value of q when **B** represents

(a) an enlargement about the origin with scale factor –2

(b) a reflection in the y–axis.

(2)

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Question 1 continued

(Total for Question 1 is 6 marks)