

1.

$$\mathbf{M} = \begin{pmatrix} 4 & -5 \\ 2 & -7 \end{pmatrix}$$

(a) Show that the matrix \mathbf{M} is non-singular.

(2)

The transformation T of the plane is represented by the matrix \mathbf{M} .

The triangle R is transformed to the triangle S by the transformation T .

Given that the area of S is 63 square units,

(b) find the area of R .

(2)

(c) Show that the line $y = 2x$ is invariant under the transformation T .

(2)