

## UNIT 7 Transformations

## Mental Tests

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### M 7.1 Standard Route (*no calculator*)

Look at the *Information Sheet* for this test.

1. Which shape do you obtain if you reflect A in the  $x$ -axis? (I)
2. Which shape do you obtain if you reflect A in the  $y$ -axis? (B)
3. Which shape do you obtain if you translate A by the vector  $\begin{pmatrix} 2 \\ 3 \end{pmatrix}$ ? (C)
4. What vector is needed to translate G onto H?  $\begin{pmatrix} 5 \\ 1 \end{pmatrix}$
5. What vector is needed to translate B onto D?  $\begin{pmatrix} 10 \\ 0 \end{pmatrix}$
6. Shape A is rotated through  $180^\circ$  about the point (0, 0). Which shape do you obtain? (H)
7. What vector is needed to translate D onto J?  $\begin{pmatrix} -2 \\ -10 \end{pmatrix}$
8. Which shapes are enlargements of D? (E, F, K)
9. Which shape do you obtain if you reflect H in the  $y$ -axis? (I)
10. Which shape do you obtain if you reflect H in the  $x$ -axis? (B)

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### M 7.2 Academic Route (*no calculator*)

Look at the *Information Sheet* for this test.

1. The shape D is enlarged to give E. What is the scale factor? (3)
2. The shape G is translated onto H. What is the vector for this translation?  $\begin{pmatrix} 5 \\ 1 \end{pmatrix}$
3. The shape A is reflected onto D. What is the equation of the mirror line? ( $x = 5$ )
4. The shape I is rotated onto J. What is the angle of rotation? ( $180^\circ$ )
5. The shape C is translated to A. What is the vector for this translation?  $\begin{pmatrix} -2 \\ -3 \end{pmatrix}$
6. Through what angle is the shape E rotated to obtain F? ( $90^\circ$  clockwise)
7. When H is reflected in the  $x$ -axis, which shape do you obtain? (B)
8. When A is reflected in the  $y$ -axis, which shape do you obtain? (B)
9. What type of transformation takes shape H onto shape A? (Rotation)
10. What type of transformation takes shape B onto shape J? (Translation)

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### M 7.3 Academic Route *(no calculator)*

Look at the *Information Sheet* for this test.

1. The shape A is reflected onto the shape D. What is the equation of the mirror line? ( $x = 5$ )
2. The shape B is translated onto J. What is the vector for this translation?  $\left( \begin{pmatrix} 8 \\ -10 \end{pmatrix} \right)$
3. The shape E is rotated onto F.
  - (a) What are the coordinates of the centre of rotation?  $((15, -3))$
  - (b) What is the angle of rotation?  $(90^\circ \text{ clockwise})$
4. The shape D is enlarged onto E.
  - (a) What is the scale factor?  $(3)$
  - (b) What are the coordinates of the centre of enlargement?  $((5, 4))$
5. The shape I is rotated onto J.
  - (a) What is the angle of rotation?  $(180^\circ)$
  - (b) What are the coordinates of the centre of rotation?  $((4, -5))$
6. The shape D is reflected onto L. What is the equation of the mirror line?  $(y = -4)$
7. What vector is needed to translate shape H onto shape G?  $\left( \begin{pmatrix} -5 \\ -1 \end{pmatrix} \right)$

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Information Sheet

