Extra Content for Foundation GCSE

123. Transformations: Rotation, Reflection, and Translation

Practice Questions

1. Translate the shape $A(1,2)$, $B(3,2)$, $C(3,4)$ by the vector $\begin{pmatrix}4\\-1\end{pmatrix}$. Write the new coordinates.
2. Reflect the point $(5,3)$ over the x-axis. What are the new coordinates?
3. Rotate the point $(2,4)$ 90° clockwise about the origin. What are the new coordinates?
4. Reflect the shape $A(2,1)$, $B(4,1)$, $C(4,3)$ over the line $x=1$. Write the new coordinates.
5. Rotate the shape $A(1,1)$, $B(3,1)$, $C(3,3)$ 180° about the origin. What are the new coordinates?
6. Translate the shape $A(0,0)$, $B(2,0)$, $C(2,2)$ by the vector $\begin{pmatrix}-3\\2\end{pmatrix}$. Write the new coordinates.
7. Reflect the point $(-2,5)$ over the y-axis. What are the new coordinates?
8. Rotate the point $(3,-2)$ 90° anticlockwise about the origin. What are the new coordinates?
9. Reflect the shape $A(1,2)$, $B(3,2)$, $C(3,4)$ over the line $y=x$. Write the new coordinates.
10. Rotate the shape $A(2,2)$, $B(4,2)$, $C(4,4)$ 270° clockwise about the origin. What are the new coordinates?

Scenario Questions

1. A flag is moved 5 units right and 3 units down. Write the translation vector.
2. A mirror is placed along the y-axis. If a point is at $(4,3)$, where is its reflection?
3. A clock hand rotates 90° clockwise. If the tip of the hand is at $(0,5)$, where is it after rotation?
4. A tile is reflected over the line $x=2$. If one corner is at $(3,4)$, where is its reflection?
5. A car moves 6 units left and 2 units up. Write the translation vector.
6. A shape is rotated 180° about the origin. If one vertex is at $(2,-3)$, where is it after rotation?
7. A poster is reflected over the x-axis. If the top-right corner is at $(5,7)$, where is its reflection?
8. A windmill blade rotates 90° anticlockwise. If the tip is at $(1,1)$, where is it after rotation?
9. A shape is translated by $\begin{pmatrix}-4\\3\end{pmatrix}$. If one vertex is at $(2,5)$, where is it after translation?
10. A logo is reflected over the line $y=-x$. If one point is at $(3,2)$, where is its reflection?

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Practice Questions

1. New coordinates: $A(5,1), B(7,1), C(7,3)$
2. New coordinates: $(5,-3)$
3. New coordinates: $(4,-2)$
4. New coordinates: $A(0,1), B(-2,1), C(-2,3)$
5. New coordinates: $A(-1,-1), B(-3,-1), C(-3,-3)$
6. New coordinates: $A(-3,2), B(-1,2), C(-1,4)$
7. New coordinates: $(2,5)$
8. New coordinates: $(2,3)$
9. New coordinates: $A(2,1), B(2,3), C(4,3)$
10. New coordinates: $A(2,-2), B(2,-4), C(4,-4)$

Answers

Scenario Questions

1. Translation vector: $\begin{pmatrix} 5 \\ -3 \end{pmatrix}$
2. Reflection: $(-4,3)$
3. After rotation: $(5,0)$
4. Reflection: $(1,4)$
5. Translation vector: $\begin{pmatrix} -6 \\ 2 \end{pmatrix}$
6. After rotation: $(-2,3)$
7. Reflection: $(5,-7)$
8. After rotation: $(-1,1)$
9. After translation: $(-2,8)$
10. Reflection: $(-2,-3)$