Extra Content for Foundation GCSE

121. Describing and Representing Translations as Vectors

Practice Questions

1. Write the vector that represents a translation of 5 units right and 3 units up.
2. A point moves 2 units left and 4 units down. Write the vector for this translation.
3. What is the translation vector for a movement 6 units down?
4. A shape is translated by the vector $\begin{pmatrix} -3 \\ 5 \end{pmatrix}$. Describe this movement.
5. Translate the point (2, –1) using the vector $\begin{pmatrix} 4 \\ 3 \end{pmatrix}$. What is the new coordinate?
6. Translate the point (–5, 7) using the vector $\begin{pmatrix} -2 \\ -6 \end{pmatrix}$. What is the new coordinate?
7. A rectangle has vertices at (1, 2), (4, 2), (4, 5), and (1, 5). If it is translated by $\begin{pmatrix} -2 \\ 3 \end{pmatrix}$, what are the new coordinates?
8. A triangle is translated by $\begin{pmatrix} 6 \\ -4 \end{pmatrix}$. If one vertex was at (3, 1), where is it now?
9. Translate the point (0, 0) by $\begin{pmatrix} -3 \\ -2 \end{pmatrix}$. What is the result?
10. A shape moves using the vector $\begin{pmatrix} a \\ b \end{pmatrix}$. If $a = -4$ and $b = 7$, describe the movement.

Scenario Questions

1. A drone flies 5 m east and 2 m north. Represent this as a vector.
2. A robot moves 6 m west and 3 m south. What is its translation vector?
3. A person walks 10 steps forward and 4 steps left. Write the movement as a vector.
4. A video game character moves from (7, 2) to (3, –1). What is the translation vector?
5. A delivery truck moves 8 km north and 6 km east. What vector represents this?
6. A swimmer moves 3 m south and 5 m west. Write this as a vector.
7. A cyclist moves 9 m west and 4 m north. Represent this as a vector.
8. A spaceship travels from (100, 200) to (120, 230). What is its translation vector?
9. A fish swims 7 m forward and 2 m up. What is the translation vector?
10. A boat moves $\begin{pmatrix} -4 \\ 6 \end{pmatrix}$ from its position. Describe its movement.

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Answers

Practice Questions

1. Vector: $\begin{pmatrix} 5 \\ 3 \end{pmatrix}$
2. Vector: $\begin{pmatrix} -2 \\ -4 \end{pmatrix}$
3. Vector: $\begin{pmatrix} 0 \\ -6 \end{pmatrix}$
4. Movement: 3 units left and 5 units up
5. New coordinate: $(6, 2)$
6. New coordinate: $(-7, 1)$
7. New coordinates: $(-1, 5)$, $(2, 5)$, $(2, 8)$, $(-1, 8)$
8. New vertex: $(9, -3)$
9. Result: $(-3, -2)$
10. Movement: 4 units left and 7 units up

Scenario Questions

1. Vector: $\begin{pmatrix} 5 \\ 2 \end{pmatrix}$
2. Vector: $\begin{pmatrix} -6 \\ -3 \end{pmatrix}$
3. Vector: $\begin{pmatrix} -4 \\ 10 \end{pmatrix}$
4. Translation vector: $\begin{pmatrix} -4 \\ -3 \end{pmatrix}$
5. Vector: $\begin{pmatrix} 6 \\ 8 \end{pmatrix}$
6. Vector: $\begin{pmatrix} -5 \\ -3 \end{pmatrix}$
7. Vector: $\begin{pmatrix} -9 \\ 4 \end{pmatrix}$
8. Translation vector: $\begin{pmatrix} 20 \\ 30 \end{pmatrix}$
9. Vector: $\begin{pmatrix} 7 \\ 2 \end{pmatrix}$
10. Movement: 4 units left and 6 units up