Extra Content for Foundation GCSE

122. Adding, Subtracting, and Multiplying Vectors by a Scalar

Practice Questions

1. Add the vectors $\begin{pmatrix} 3 \\ 4 \end{pmatrix}$ and $\begin{pmatrix} 2 \\ -1 \end{pmatrix}$. Give your final answer as a vector.
2. Subtract the vectors $\begin{pmatrix} 5 \\ 2 \end{pmatrix} - \begin{pmatrix} 1 \\ 3 \end{pmatrix}$. Give your final answer as a vector.
3. Multiply the vector $\begin{pmatrix} 2 \\ -3 \end{pmatrix}$ by 2. Give your final answer as a vector.
4. Find $3\begin{pmatrix} 1 \\ -2 \end{pmatrix}$. Give your final answer as a vector.
5. Add $\begin{pmatrix} 4 \\ -5 \end{pmatrix} + \begin{pmatrix} -2 \\ 3 \end{pmatrix}$. Give your final answer as a vector.
6. Subtract $\begin{pmatrix} -3 \\ 6 \end{pmatrix} - \begin{pmatrix} 1 \\ -2 \end{pmatrix}$. Give your final answer as a vector.
7. Multiply $\begin{pmatrix} -4 \\ 7 \end{pmatrix}$ by -2. Give your final answer as a vector.
8. Add $\begin{pmatrix} 7 \\ 3 \end{pmatrix} + \begin{pmatrix} -5 \\ -6 \end{pmatrix}$. Give your final answer as a vector.
9. Find $2\begin{pmatrix} 3 \\ -4 \end{pmatrix} - \begin{pmatrix} 1 \\ 5 \end{pmatrix}$. Give your final answer as a vector.
10. Subtract $\begin{pmatrix} -2 \\ -3 \end{pmatrix} - \begin{pmatrix} 4 \\ 1 \end{pmatrix}$. Give your final answer as a vector.

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Scenario Questions

1. A plane moves $\begin{pmatrix} 10 \\ 15 \end{pmatrix}$ km. Then, it moves $\begin{pmatrix} -4 \\ 5 \end{pmatrix}$ km. Find its total movement. Give your final answer as a vector.
2. A robot moves $\begin{pmatrix} 8 \\ -6 \end{pmatrix}$ m. Then it moves $\begin{pmatrix} -2 \\ 9 \end{pmatrix}$ m. Find its new position. Give your final answer as a vector.
3. A ship moves $\begin{pmatrix} 12 \\ -5 \end{pmatrix}$ km, then moves $\begin{pmatrix} -3 \\ 7 \end{pmatrix}$ km. Find the resultant vector. Give your final answer as a vector.
4. A car moves $\begin{pmatrix} 3 \\ 4 \end{pmatrix}$ km, then reverses $\begin{pmatrix} -5 \\ -2 \end{pmatrix}$ km. What is the total movement? Give your final answer as a vector.
5. A delivery drone flies $\begin{pmatrix} 9 \\ 6 \end{pmatrix}$ m, then $\begin{pmatrix} -3 \\ -8 \end{pmatrix}$ m. Find the total movement. Give your final answer as a vector.
6. A wind turbine blade moves $\begin{pmatrix} -2 \\ 5 \end{pmatrix}$ m, then moves $\begin{pmatrix} 4 \\ -7 \end{pmatrix}$ m. Find the resultant vector. Give your final answer as a vector.
7. A train moves 3 times the vector $\begin{pmatrix} 2 \\ 3 \end{pmatrix}$. What is its total movement? Give your final answer as a vector.
8. A boat follows the vector $\begin{pmatrix} 4 \\ -1 \end{pmatrix}$, then moves 2 times $\begin{pmatrix} -2 \\ 3 \end{pmatrix}$. Find the total movement. Give your final answer as a vector.
9. A cyclist moves $\begin{pmatrix} 6 \\ 2 \end{pmatrix}$ km, then moves in the opposite direction $\begin{pmatrix} -6 \\ -2 \end{pmatrix}$ km. What is the final position? Give your final answer as a vector.
10. A spaceship moves $\begin{pmatrix} 7 \\ -4 \end{pmatrix}$ km, then accelerates by 2 times $\begin{pmatrix} 3 \\ 2 \end{pmatrix}$ km. Find its total movement. Give your final answer as a vector.

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Practice Questions

1. $\begin{pmatrix} 5 \\ 3 \end{pmatrix}$
2. $\begin{pmatrix} 4 \\ -1 \end{pmatrix}$
3. $\begin{pmatrix} 4 \\ -6 \end{pmatrix}$
4. $\begin{pmatrix} 3 \\ -6 \end{pmatrix}$
5. $\begin{pmatrix} 2 \\ -2 \end{pmatrix}$
6. $\begin{pmatrix} -4 \\ 8 \end{pmatrix}$
7. $\begin{pmatrix} 8 \\ -14 \end{pmatrix}$
8. $\begin{pmatrix} 2 \\ -3 \end{pmatrix}$
9. $\begin{pmatrix} 5 \\ -13 \end{pmatrix}$
10. $\begin{pmatrix} -6 \\ -4 \end{pmatrix}$

Answers

Scenario Questions

1. Total movement: $\begin{pmatrix} 6 \\ 20 \end{pmatrix}$
2. New position: $\begin{pmatrix} 6 \\ 3 \end{pmatrix}$
3. Resultant vector: $\begin{pmatrix} 9 \\ 2 \end{pmatrix}$
4. Total movement: $\begin{pmatrix} -2 \\ 2 \end{pmatrix}$
5. Total movement: $\begin{pmatrix} 6 \\ -2 \end{pmatrix}$
6. Resultant vector: $\begin{pmatrix} 2 \\ -2 \end{pmatrix}$
7. Total movement: $\begin{pmatrix} 6 \\ 9 \end{pmatrix}$
8. Total movement: $\begin{pmatrix} 0 \\ 5 \end{pmatrix}$
9. Final position: $\begin{pmatrix} 0 \\ 0 \end{pmatrix}$
10. Total movement: $\begin{pmatrix} 13 \\ 0 \end{pmatrix}$