Vector equality and opposite vectors

6 questions | 14 marks

Equivalent correct methods earn the corresponding marks.

1. Find the opposite of $(7, -3)$. [2 marks]

Negate each component.

Answer: $(-7, 3)$.

2. Are $(3, 4)$ and $(4, 3)$ equal vectors? Explain. [2 marks]

Their components differ, even though both magnitudes are 5.

Answer: No.

3. If $(a - 1, 2b) = (4, -6)$, find a and b. [2 marks]

Equate components: $a - 1 = 4$ and $2b = -6$.

Answer: $a = 5$, $b = -3$.

4. Let $A = (-1, 3)$ and $B = (4, 1)$. Find both $\overrightarrow{AB}$ and $\overrightarrow{BA}$. [3 marks]

Subtract the start from the end for each arrow.

The answers are opposites.

Answer: $(5, -2)$ and $(-5, 2)$.

5. A vector equal to $(2, -5)$ starts at $(6, 1)$. Find its endpoint. [2 marks]

Add the component changes to the starting coordinates.

Answer: $(8, -4)$.

6. Solve $\mathbf{v} = -\mathbf{v}$ and explain the result. [3 marks]

Adding $\mathbf{v}$ to both sides gives $2\mathbf{v} = \mathbf{0}$.

Only zero has no distinction between a direction and its reverse.

Answer: $\mathbf{v} = \mathbf{0}$.