

Vector Notation, Magnitude, Addition and Position Vectors

Year 11 · Geometry · y11-vectors

Name: _____

Date: _____

Class: _____

Score: ____ / ____

Instructions

Answer every question in Practice. Try the Challenge section once Practice is complete. 10 questions in total.

Practice

1. Vector $a = (3, 4)$. What is the magnitude of a , $|a|$? ($\sqrt{3^2 + 4^2}$)

2. Vector $a = (2, 3)$ and vector $b = (4, -1)$. What is $a + b$? Give your answer as (x, y) .

3. A vector has both magnitude (size) and direction, unlike a scalar which only has magnitude. Does a vector such as $(3, 4)$ have direction as well as magnitude?

4. The position vector $OA = (2, 3)$ and $OB = (5, 7)$. The vector $AB = OB - OA$. What is AB ? Give your answer as (x, y) .

5. Vector $a = (5, 2)$ and vector $b = (3, 4)$. What is $a - b$? Give your answer as (x, y) .

6. To find the magnitude of a vector (x, y) , use Pythagoras: $|v| = \sqrt{x^2 + y^2}$, squaring both components first. Vector $a = (6, 8)$. What is $|a|$?

7. To add vectors, add the matching x-components together and the matching y-components together separately. Vector $a = (1, 5)$ and vector $b = (3, -2)$. What is $a + b$?

8. A vector is written in bold or with an arrow above it, e.g. $\vec{a}$ or $\vec{AB}$, to distinguish it from a scalar quantity that has no direction. Does a distance of 5km (with no stated direction) count as a vector?

Challenge

1. Vector $a = (1, 2)$ and vector $b = (3, -2)$. What is $a + 2b$? ($a + 2 \times b$)

2. Vector $a = (20, 21)$. What is the magnitude of a , $|a|$?
