

Precalculus - Vectors in the Plane - Test

Common Core N-VM.A.1, N-VM.A.2, N-VM.A.3, N-VM.B.4, N-VM.B.5 · maths-pdf.fr/en/

Name: _____ Class: _____ Date: ____/____/____

This 20-point test covers vector components, operations, the dot product and applications with force and wind (N-VM.A, N-VM.B). You have 45 minutes. Show your work.

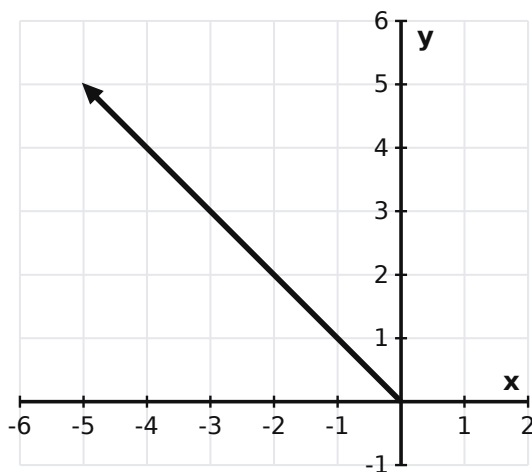
About this test

- Grade: Precalculus
- Chapter: Vectors in the Plane
- Standards: N-VM.A.1, N-VM.A.2, N-VM.A.3, N-VM.B.4, N-VM.B.5
- Time: 45 minutes
- Total: 20 points

Question 1 - Component form and magnitude [2 pts]

Find the component form and magnitude of the vector from $P(-3,4)$ to $Q(2,-8)$.

Question 2 - Magnitude and direction [2 pts]



The vector.

Find the magnitude and direction angle of $\langle -5,5 \rangle$.

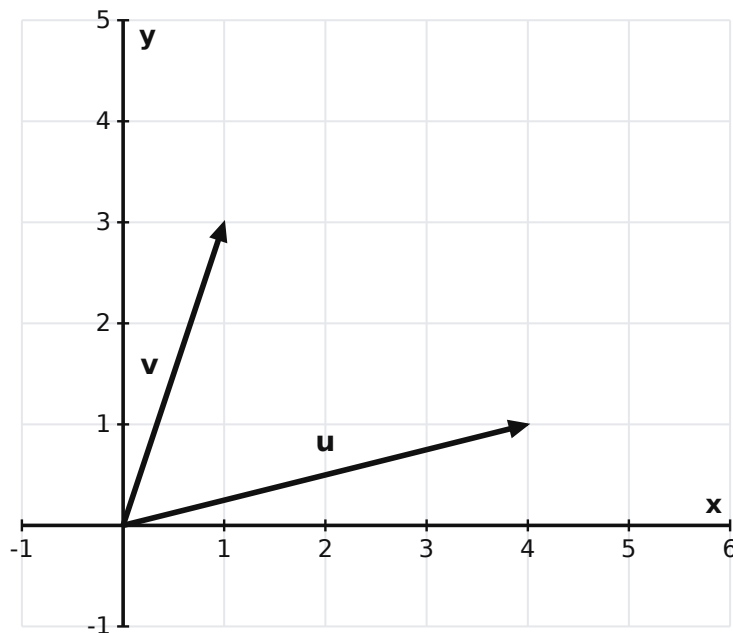
Question 3 - Vector arithmetic [2 pts]

Let $\vec{u} = \langle 4, -1 \rangle$ and $\vec{v} = \langle -2, 3 \rangle$. Find $2\vec{u} - 3\vec{v}$.

Question 4 - Unit vector [2 pts]

Find the unit vector in the direction of $\langle -5, 12 \rangle$.

Question 5 - Sum of two vectors [3 pts]



Vectors $\vec{u}$ and $\vec{v}$.

The vectors $\vec{u}$ and $\vec{v}$ are shown. (a) Write each in component form. (b) Find $\vec{u} + \vec{v}$. (c) Find $|\vec{u} + \vec{v}|$ to the nearest hundredth.

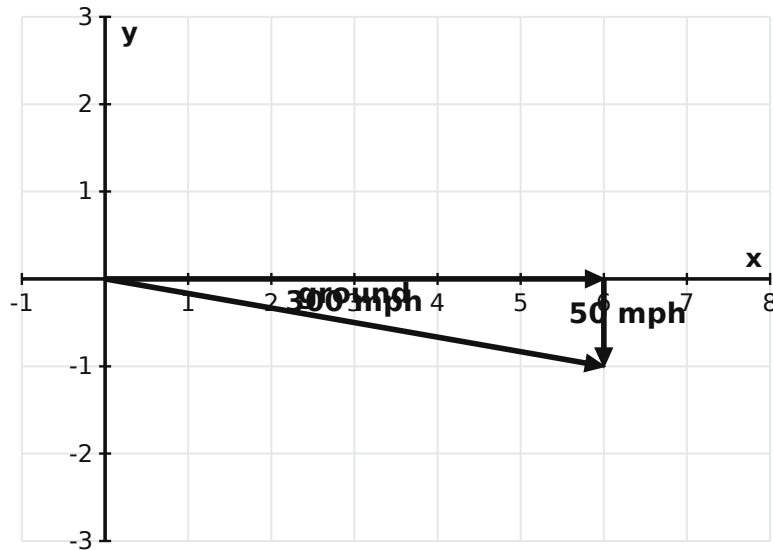
Question 6 - Perpendicular vectors [2 pts]

Find k so that $\langle 3, k \rangle$ and $\langle 4, -6 \rangle$ are perpendicular.

Question 7 - Angle between vectors [2 pts]

Find the angle between $\langle 2, 3 \rangle$ and $\langle -1, 4 \rangle$ to the nearest hundredth of a degree.

Question 8 - Airplane and wind [3 pts]



Plane heading east with a wind from the north.

A plane flies due east at 300 mph relative to the air. A wind blows toward the south at 50 mph. (a) Write the ground velocity in component form. (b) Find the ground speed to the nearest tenth. (c) Find the angle south of east of its path to the nearest tenth.

Question 9 - Work [2 pts]

A force $\langle 20, 15 \rangle$ N moves an object along $\langle 4, 3 \rangle$ m. Find the work $W = \vec{F} \cdot \vec{d}$.