

The Secret of Vectors in Pre-Calculus, Calculus and Multi-Variable Calculus

Lesson 200 | Precalculus | Vectors and dot products

<https://www.youtube.com/watch?v=6qAmv60pQQE>

Original practice aligned to the saved video title.

Name: _____ Date: _____ Show your reasoning.

01

For $u = \langle 14, 12 \rangle$ and $v = \langle 10, -6 \rangle$, find $u+v$, $u \cdot v$, $|u|$, and decide whether they are perpendicular.

02

For $u = \langle 2, 4 \rangle$ and $v = \langle 11, -7 \rangle$, find $u+v$, $u \cdot v$, $|u|$, and decide whether they are perpendicular.

03

For $u = \langle 11, 13 \rangle$ and $v = \langle 8, -2 \rangle$, find $u+v$, $u \cdot v$, $|u|$, and decide whether they are perpendicular.

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04

For $u = \langle 11, 10 \rangle$ and $v = \langle 4, -7 \rangle$, find $u+v$, $u \cdot v$, $|u|$, and decide whether they are perpendicular.

05

For $u = \langle 2, 11 \rangle$ and $v = \langle 3, -4 \rangle$, find $u+v$, $u \cdot v$, $|u|$, and decide whether they are perpendicular.

06

For $u = \langle 4, 2 \rangle$ and $v = \langle 5, -3 \rangle$, find $u+v$, $u \cdot v$, $|u|$, and decide whether they are perpendicular.

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01

For $u = \langle 14, 12 \rangle$ and $v = \langle 10, -6 \rangle$, find $u+v$, $u \cdot v$, $|u|$, and decide whether they are perpendicular.

$u+v = \langle 24, 6 \rangle$. $u \cdot v = 140 - 72 = 68$. $|u| = \sqrt{340}$. Nonzero dot product: not perpendicular.

02

For $u = \langle 2, 4 \rangle$ and $v = \langle 11, -7 \rangle$, find $u+v$, $u \cdot v$, $|u|$, and decide whether they are perpendicular.

$u+v = \langle 13, -3 \rangle$. $u \cdot v = 22 - 28 = -6$. $|u| = \sqrt{20}$. Nonzero dot product: not perpendicular.

03

For $u = \langle 11, 13 \rangle$ and $v = \langle 8, -2 \rangle$, find $u+v$, $u \cdot v$, $|u|$, and decide whether they are perpendicular.

$u+v = \langle 19, 11 \rangle$. $u \cdot v = 88 - 26 = 62$. $|u| = \sqrt{290}$. Nonzero dot product: not perpendicular.

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04

For $u = \langle 11, 10 \rangle$ and $v = \langle 4, -7 \rangle$, find $u+v$, $u \cdot v$, $|u|$, and decide whether they are perpendicular.

$u+v = \langle 15, 3 \rangle$. $u \cdot v = 44 - 70 = -26$. $|u| = \sqrt{221}$. Nonzero dot product: not perpendicular.

05

For $u = \langle 2, 11 \rangle$ and $v = \langle 3, -4 \rangle$, find $u+v$, $u \cdot v$, $|u|$, and decide whether they are perpendicular.

$u+v = \langle 5, 7 \rangle$. $u \cdot v = 6 - 44 = -38$. $|u| = \sqrt{125}$. Nonzero dot product: not perpendicular.

06

For $u = \langle 4, 2 \rangle$ and $v = \langle 5, -3 \rangle$, find $u+v$, $u \cdot v$, $|u|$, and decide whether they are perpendicular.

$u+v = \langle 9, -1 \rangle$. $u \cdot v = 20 - 6 = 14$. $|u| = \sqrt{20}$. Nonzero dot product: not perpendicular.