20. 0/1 points | Previous Answers SPreCalc7 9.1.028.MI.

Write the given vector in terms of **i** and **j**.

$\mathbf{u} = \langle -8, 5 \rangle$

$\mathbf{u} =$ $-8i + 5j$

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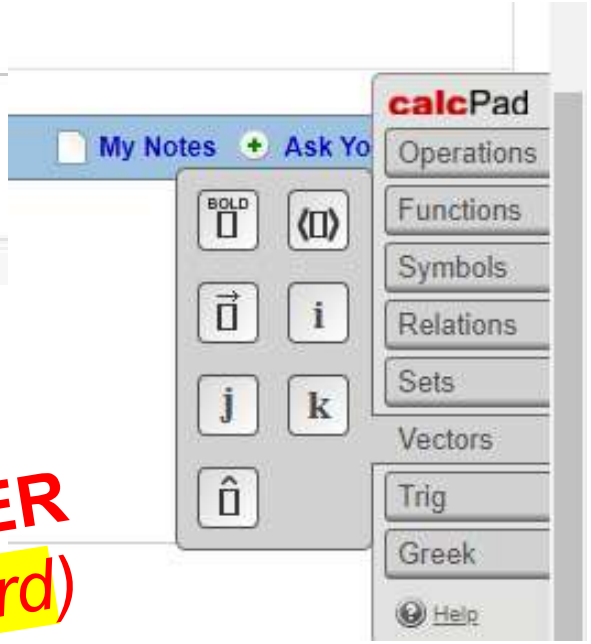

USE VECTOR TOOLS →
TO ENTER YOUR ANSWER
(don't use i, j, k on keyboard)

Vector representation (component form):

$$v = \langle x_2 - x_1,\ y_2 - y_1 \rangle$$

NOTES 9.1

Magnitude: $|v| = \sqrt{x^2 + y^2}$

horizontal *vertical*

components

The sum of unit vectors in 2 dimensions: $\langle -2, 3 \rangle = -2\vec{i} + 3\vec{j}$

DEFINITION OF THE DOT PRODUCT

NOTES 9.2

If $\mathbf{u} = \langle a_1, a_2 \rangle$ and $\mathbf{v} = \langle b_1, b_2 \rangle$ are vectors, then their **dot product**, denoted by $\mathbf{u} \cdot \mathbf{v}$, is defined by

multiply like components

$$\mathbf{u} \cdot \mathbf{v} = a_1 b_1 + a_2 b_2$$

The dot product is not a vector; it is a real number, or scalar (comparison of slopes.)

If u•v = 0, then vector u and v are perpendicular.

NOTES 9.2

ANGLE BETWEEN TWO VECTORS

If θ is the angle between two nonzero vectors $\mathbf{u}$ and $\mathbf{v}$, then

$$\cos\theta = \frac{\mathbf{u} \cdot \mathbf{v}}{|\mathbf{u}||\mathbf{v}|}$$

← dot product

Magnitude →

← Magnitude

Notes: 9.3, 9.4 3-D Vectors

If given points : (x_1, y_1, z_1) *and* (x_2, y_2, z_2) **then**

Vector Component Form:

$$v = \langle x_2 - x_1,\ y_2 - y_1,\ z_2 - z_1 \rangle$$

The sum of unit vectors in 3 dimensions:

$$\langle 8, -13, 2 \rangle = 8i - 13j + 2k$$

Notes: 9.3, 9.4 3-D Vectors

Magnitude (same as length or distance)

$$|u| = \sqrt{(a_1)^2 + (a_2)^2 + (a_3)^2} \quad \text{if } \mathbf{u} = \langle a_1, a_2, a_3 \rangle$$

Dot Product:

If $\vec{\mathbf{u}} = \langle a_1, a_2, a_3 \rangle$ and $\vec{\mathbf{v}} = \langle b_1, b_2, b_3 \rangle$

then $\mathbf{u} \cdot \mathbf{v} = a_1 b_1 + a_2 b_2 + a_3 b_3$ ←multiply like components

If $\mathbf{u} \cdot \mathbf{v} = 0$, then vector u and v are perpendicular.