

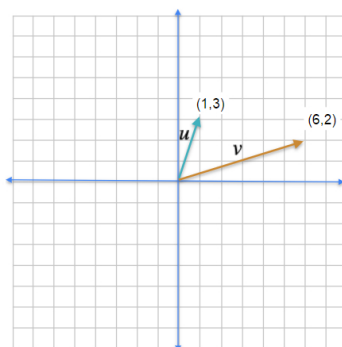


This is an **ungraded quiz**. This means that, even though you will get a grade for the quiz, the **quiz score will not count in your final grade**.

1. Which of the following options is true for a vector?

1 point

- ☒ A vector has a magnitude and direction.
- ☐ A vector has a shape and weight.
- ☐ A vector has only a magnitude.
- ☐ A vector has only direction.



1 point

2. Compute the sum of the vectors \vec{u} and \vec{v} . Hint: The sum vector is the diagonal in a parallelogram formed by the two vectors, $\vec{u} = (1, 3)$ and $\vec{v} = (6, 2)$.

- ☒ $\vec{u} + \vec{v} = (7, 5)$
- ☐ $\vec{u} + \vec{v} = (6, 3)$
- ☐ $\vec{u} + \vec{v} = 3$
- ☐ $\vec{u} + \vec{v} = 20$

3. Compute the difference of the vectors \vec{u} and \vec{v} .

1 point

- ☐ $\vec{u} - \vec{v} = (5, 1)$
- ☐ $\vec{u} - \vec{v} = (-1, 5)$
- ☐ $\vec{u} - \vec{v} = 3$
- ☒ $\vec{u} - \vec{v} = (-5, 1)$

4. Calculate the dot product of the given vectors \vec{a} and \vec{b} and select the correct answer.

1 point

$$\vec{a} = \begin{bmatrix} -1 \\ 5 \\ 2 \end{bmatrix}, \vec{b} = \begin{bmatrix} -3 \\ 6 \\ -4 \end{bmatrix}$$

- ☐ $\begin{bmatrix} 1 \\ 0 \\ 1 \end{bmatrix}$
- ☐ 30
- ☒ 25
- ☐ $\begin{bmatrix} -3 \\ 30 \\ -8 \end{bmatrix}$

5. Which of the following is true, if $\vec{a} \cdot \vec{a} = 0$ and $\vec{a} \cdot \vec{b} = 0$?

1 point

- ☒ $\vec{a} = 0, \vec{b} = 0$
- ☐ $\vec{a} \neq 0, \vec{b} = 0$
- ☐ $\vec{a} \cdot \vec{a} = 1$
- ☐ $\vec{a} = 0, \vec{b} = \text{any vector}$

6. Which of the following is the correct representative system of equation for the given dot product:

1 point

$$\begin{bmatrix} 3 & 5 & 1 \end{bmatrix} \cdot \begin{bmatrix} x \\ y \\ z \end{bmatrix} = 10$$

$$\begin{bmatrix} 7 & -2 & 4 \end{bmatrix} \cdot \begin{bmatrix} x \\ y \\ z \end{bmatrix} = 2$$

$$\begin{bmatrix} -6 & 3 & 2 \end{bmatrix} \cdot \begin{bmatrix} x \\ y \\ z \end{bmatrix} = 15$$

The image above represents the following:

$$\begin{bmatrix} 3 & 5 & 1 \end{bmatrix} \cdot \begin{bmatrix} x \\ y \\ z \end{bmatrix} = 10$$

$$\begin{bmatrix} 7 & -2 & 4 \end{bmatrix} \cdot \begin{bmatrix} x \\ y \\ z \end{bmatrix} = 2$$

$$\begin{bmatrix} -6 & 3 & 2 \end{bmatrix} \cdot \begin{bmatrix} x \\ y \\ z \end{bmatrix} = 15$$

☒ $\begin{cases} 3x + 5y + z = 10 \\ 7x - 2y + 4z = 2 \\ -6x + 3y + 2z = 15 \end{cases}$

☐ $\begin{cases} 3x + 5y + z = 2 \\ 7x - 2y + 4z = 1 \\ -6x + 3y + 2z = 20 \end{cases}$

☐ $\begin{cases} 3x - 2y + 4z = 10 \\ 7x - 2y + 4z = 2 \\ -6x + 3y + 2z = 15 \end{cases}$