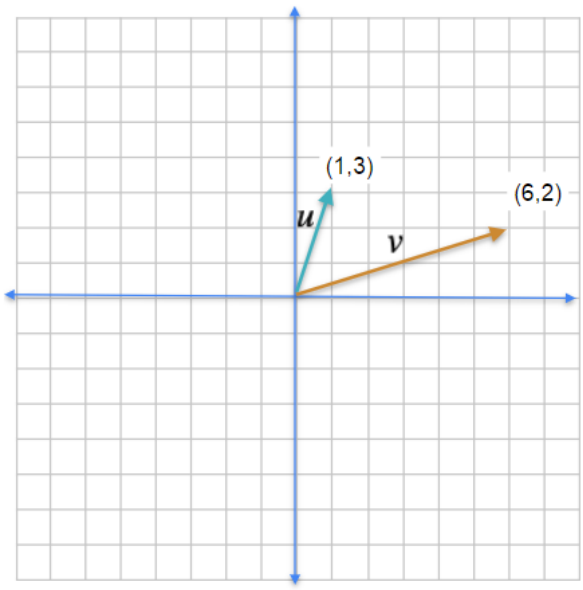
1. **Which of the following options is true for a vector?** 1 point

- A vector has a shape and weight.
- A vector has a magnitude and direction.
- 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 $\vec{v} = (6, 2)$.

- $\vec{u} + \vec{v}$ = (6, 3)
- $\vec{u} + \vec{v}$ = (7, 5)
- $\vec{u} + \vec{v}$ = 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)
- $\vec{u} - \vec{v}$ = (-5, 1)
- $\vec{u} - \vec{v}$ = (-1, 5)
- $\vec{u} - \vec{v}$ = 3

4. **Calculate the dot product of the given vectors $\vec{a} \cdot \vec{b}$ and select the correct answer.** 1 point

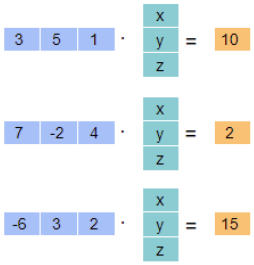
$$\vec{a} = \begin{bmatrix} -1 \\ 5 \\ 2 \end{bmatrix}, \vec{b} = \begin{bmatrix} -3 \\ 6 \\ -4 \end{bmatrix}$$

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

5. **Which of the following is true, if $\vec{a} \cdot \vec{a} = 0$ and $\vec{a} \cdot \vec{b} = 0$?** 1 point

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

6. **Which of the following is the correct representative system of equation for the given dot product:** 1 point



The image above represents the following:

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

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

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

- $\begin{cases} 3x + 5y + z = 10 \\ 7x–2y + 4z = 2 \\ -6x + 3y + 2z = 15 \end{cases}$
- $\begin{cases} 3x - 2y + 4z = 10 \\ 7x–2y + 4z = 2 \\ -6x + 3y + 2z = 15 \end{cases}$
- $\begin{cases} 3x + 5y + z = 2 \\ 7x–2y + 4z = 1 \\ -6x + 3y + 2z = 20 \end{cases}$