Congratulations! You passed!

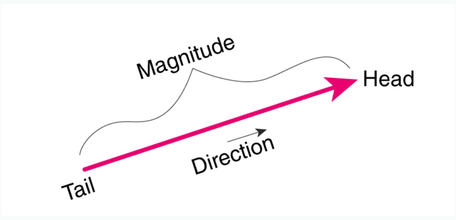
Grade received 83.33% To pass 67% or higher

Go to next item

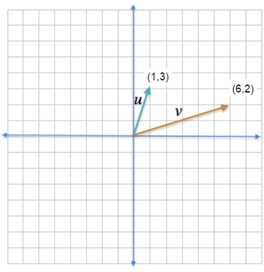
1. Which of the following options is true for a vector? 1 / 1 point

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

Correct
Correct!



2. 1 / 1 point



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

Correct
Correct! $\vec{u} + \vec{v} = ((1 + 6), (3 + 2))$

3. Compute the difference of the vectors $\vec{u}$ and $\vec{v}$. 1 / 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)

Correct
Correct! $\vec{u} - \vec{v} = ((1 - 6), (3 - 2))$

4. Calculate the dot product of the given vectors $\vec{a} \cdot \vec{b}$ and select the correct answer. 1 / 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
- 30
- $\begin{bmatrix} 1 \\ 0 \\ 1 \end{bmatrix}$

Correct
Correct! By applying the formula you saw in the video "The dot product" as follows: $\vec{a} \cdot \vec{b} = a_1 \cdot b_1 + a_2 \cdot b_2 + a_3 \cdot b_3$, you have:

$\vec{a} \cdot \vec{b} = (-1) \cdot (-3) + 5 \cdot 6 + 2 \cdot (-4) = 3 + 30 - 8 = 25.$

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

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

Incorrect
Not quite but almost there. From the given statements, $\vec{a}$ is always 0, what about $\vec{b}$? While a = 0, b = 0 satisfy the equations, this is not a complete set of solution. Try with a few other numbers to see what happens.

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

3	5	1	·	x y z	=	10
7	-2	4	·	x y z	=	2
-6	3	2	·	x y z	=	15

The image above represents the following:

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

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

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

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

Correct
Correct!

The first element (3) gets multiplied with the first element of the vector (x), the second element (5) gets multiplied with the second element of the vector (y), and the third element (1) gets multiplied with the third element of the vector (z). This will form the first equation which is equal to 10 in the system of equations. Apply the same for the remaining elements to form the two other equations.