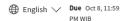


Graded Ouiz • 1h



## Congratulations! You passed!

Grade received 87.50%

Latest Submission Grade 87.50% **To pass** 75% or higher

Go to next item

1/1 point



1. Given the vectors:

 $\vec{v}$ = (1, 0, 7)

*w*= (0, −1, 2)

find the distance between them,  $d(\vec{v}, \vec{w})$ 

- $\bigcirc$  5
- $\bigcirc$  -2
- $\bigcirc$   $\sqrt{(23)}$

**⊘** Correct

Correct!  $d(ec{v},ec{w}) = \sqrt{(0-1)^2 + (-1-0)^2 + (2-7)^2}$ 

2. You are given the points P: (1, 0, -3) and Q: (-1,0,-3). The magnitude of the vector from P to Q is:

1/1 point

- 2
- O 3
- O -2
  - **⊘** Correct

Correct! The magnitude of the vector is the distance between points P and Q, which you find by using the following:  $\sqrt{((-1)-1)^2+0^2+((-3)-(-3))}=\sqrt{4}=2$ 

3. Select the correct statements pertaining to the dot product.

1/1 point

- ☐ The dot product of orthogonal vectors is always 1.
- The dot product of orthogonal vectors is always 0.
- ✓ Correct

Correct! Since both vectors are perpendicular to each other, the dot product is always 0.

- The dot product of two vectors is always a scalar.

**⊘** Correct

Correct! The dot product gives us a real number, therfore a scalar.

4. Calculate the norm ||v|| of the vector  $\vec{v}$  = (1, -5, 2, 0,-3) and select the correct answer.

1/1 point

- (a)  $||v|| = \sqrt{39}$
- $\bigcirc \ \|v\| = \sqrt{35}$
- $\bigcirc \ \|v\| = 5$
- $\bigcirc \ \|v\| = 39$

**⊘** Correct

Correct!  $\|v\| = \sqrt{((1^2) + (-5)^2 + 2^2 + 0^2 + (-3)^2)} = \sqrt{39}$ 

5. Which of the vectors has the greatest norm?

0 / 1 point

$$\begin{bmatrix}
1 \\
2 \\
-3
\end{bmatrix}$$

$$\begin{bmatrix} 1 \\ 0 \\ -2 \\ 0 \end{bmatrix}$$



- 0
- $\begin{bmatrix} 0 \\ 0 \\ 0 \end{bmatrix}$

Not quite. Review the video on finding the norm of a vector (The dot product ∠.).

For a vector  $ec{v}=(x,y,z)$  , the norm  $\|v\|=\sqrt{(x^2)+(y^2)+(z^2)}$ 

6. Calculate the dot product  $ec{a} \cdot ec{b}$  and select the correct answer.

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

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

## **⊘** Correct

Correct! By applying the formula you saw in the video The dot product ☐ as follows:  $\vec{a}\cdot\vec{b}=ax\cdot bx+ay\cdot by+az\cdot bz$ , you have:

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

7. Which of the following is the result of performing the multiplication  $M_1\cdot M_2$ ? Where  $M_1$  and  $M_2$  are given by:

$$M_1 = \begin{bmatrix} 2 & -1 \\ 3 & -3 \end{bmatrix}, M_2 = \begin{bmatrix} 5 & -2 \\ 0 & 1 \end{bmatrix}.$$

- $\bigcirc \begin{bmatrix} 10 \\ 15 \end{bmatrix}$

## **⊘** Correct

Correct! Remember from the video  $\frac{\text{Matrix Multiplication}}{c_3}$  [ $\frac{c}{c}$ ], to multiply matrices, you have:  $\begin{bmatrix} c_1 & c_2 \\ c_3 & c_4 \end{bmatrix}$ where in the matrices given:

$$c_1 = 2 \cdot 5 + (-1) \cdot 0 = 10$$
,

$$c_2 = 2 \cdot (-2) + (-1) \cdot 1 = -5,$$

$$c_3 = 3 \cdot 5 + (-3) \cdot 0 = 15,$$

$$c_4 = 3 \cdot (-2) + (-3) \cdot 1 = -9.$$

When you replace these values back onto the matrix, you obtain:  $\begin{bmatrix} 10 & -5 \\ 15 & -9 \end{bmatrix}$ 

8. Calculate the dot product  $\vec{w}\cdot\vec{z}$  and select the correct answer.

$$\vec{w} = \begin{bmatrix} -9 \\ -1 \end{bmatrix}, \vec{z} = \begin{bmatrix} -3 \\ -5 \end{bmatrix}$$

1/1 point

1/1 point

1/1 point

- $\bigcirc \, \begin{bmatrix} -27 \\ -5 \end{bmatrix}$
- 32
- $\bigcirc \begin{bmatrix} 27 \\ 5 \end{bmatrix}$
- O 35

$$\bigcirc$$
 Correct 
$$\text{Correctt } \vec{w} \cdot \vec{z} = \begin{bmatrix} -9 \\ -1 \end{bmatrix} \cdot \begin{bmatrix} -3 \\ -5 \end{bmatrix} = (-9) \left( -3 \right) + \left( -1 \right) \left( -5 \right) = 32$$