Congratulations! You passed!

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

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1. **Given the vectors:** 1 / 1 point

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

$\vec{w}$= (0, -1, 2)

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

- (●) $\sqrt{(27)}$
- ( ) -2
- ( ) $\sqrt{(23)}$
- ( ) 5

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

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
- ( ) 3
- ( ) -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.
- [x] The dot product of two vectors is always a scalar.

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

- [ ] The dot product vector is the diagonal in a parallelogram formed by the two vectors $\vec{u}$ and $\vec{v}$.
- [x] 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.

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

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

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

- $\begin{bmatrix} 2 \\ 5 \end{bmatrix}$
- $\begin{bmatrix} 1 \\ 2 \\ -3 \end{bmatrix}$
- $\begin{bmatrix} 0 \\ 0 \\ 0 \\ 0 \end{bmatrix}$
- $\begin{bmatrix} 1 \\ 0 \\ -2 \\ 0 \\ -1 \end{bmatrix}$
- $\begin{bmatrix} 2 \\ 2 \\ 2 \\ 2 \end{bmatrix}$

⊗ **Incorrect**

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

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

6. **Calculate the dot product $\vec{a}\cdot\vec{b}$ and select the correct answer.** 1 / 1 point

$$\vec{a}=\begin{bmatrix}3\\7\\1\end{bmatrix},\vec{b}=\begin{bmatrix}4\\0\\3\end{bmatrix}$$

- $\begin{bmatrix}12\\0\\3\end{bmatrix}$
- $\begin{bmatrix}1\\0\\1\end{bmatrix}$
- (selected) 15
- 30

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:

$$\vec{a}\cdot\vec{b}=3\cdot4+7\cdot0+1\cdot3=12+0+3=15.$$

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:** 0 / 1 point

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

- $\begin{bmatrix}10&15\\-3&-4\end{bmatrix}$
- $\begin{bmatrix}10&-5\\15&-9\end{bmatrix}$
- $\begin{bmatrix}10&-3&1\\15&-4&0\\1&0&1\end{bmatrix}$
- (selected) $\begin{bmatrix}10&3\\15&4\end{bmatrix}$

Incorrect

Check the signs in front of some of the values and try again. You can review matrix multiplication in the video Matrix Multiplication.

8. **Calculate the dot product $\vec{w}\cdot\vec{z}$ and select the correct answer.** 1 / 1 point

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

- $\begin{bmatrix}-27\\-5\end{bmatrix}$
- (selected) 32
- 35
- $\begin{bmatrix}27\\5\end{bmatrix}$

Correct

Correct! $\vec{w}\cdot\vec{z}=\begin{bmatrix}-9\\-1\end{bmatrix}\cdot\begin{bmatrix}-3\\-5\end{bmatrix}=(-9)(-3)+(-1)(-5)=32$