¡Felicitaciones! ¡Aprobaste!

Calificación recibida 100 %
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Para Aprobar 80 % o más

Ir al siguiente elemento

1. In this assessment, you will be tested on all of the different topics you have in covered this module. Good luck! **1 / 1 punto**

A ship travels with velocity given by

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

[1 2], with current flowing in the direction given by $\begin{bmatrix} 1 \\ 1 \end{bmatrix}$ with respect to some co-ordinate axes.

What is the velocity of the ship in the direction of the current?

- $\begin{bmatrix} 3/2 \\ 2/3 \end{bmatrix}$ [3/2 2/3]
- $\begin{bmatrix} 3/2 \\ 3/2 \end{bmatrix}$ [3/2 3/2]

$\begin{bmatrix} 2/3 \\ 2/3 \end{bmatrix}$

[2/3, 2/3]

$\begin{bmatrix} 2/3 \\ 3/2 \end{bmatrix}$

[2/3, 3/2]

Correcto

This is the vector projection of the velocity of the ship onto the velocity of the current.

2. A ball travels with velocity given by **1 / 1 punto**

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

$\begin{bmatrix} 2 \\ 1 \end{bmatrix}$, with wind blowing in the direction given by $\begin{bmatrix} 3 \\ -4 \end{bmatrix}$ with respect to some co-ordinate axes.

What is the size of the velocity of the ball in the direction of the wind?

- $\frac{5}{2}$
- $-\frac{2}{5}$
- $-\frac{5}{2}$
- $\frac{2}{5}$

Correcto

This is the scalar projection of the velocity of the ball onto the velocity of the wind.

3. Given vectors **1 / 1 punto**

$$\begin{bmatrix} -4 \\ -3 \\ 8 \end{bmatrix}$$

$\mathbf{v} = \begin{bmatrix} -4 \\ -3 \\ 8 \end{bmatrix}$, $\mathbf{b_1} = \begin{bmatrix} 1 \\ 2 \\ 3 \end{bmatrix}$, $\mathbf{b_2} = \begin{bmatrix} -2 \\ 1 \\ 0 \end{bmatrix}$ and $\mathbf{b_3} = \begin{bmatrix} -3 \\ -6 \\ 5 \end{bmatrix}$ all written in the standard basis, what is $\mathbf{v}$ in the basis defined by $\mathbf{b_1}$, $\mathbf{b_2}$ and $\mathbf{b_3}$? You are given that $\mathbf{b_1}$, $\mathbf{b_2}$ and $\mathbf{b_3}$ are all pairwise orthogonal to each other.

- [x] $\begin{bmatrix} 1 \\ 1 \\ 1 \end{bmatrix}$
- [ ] $\begin{bmatrix} 0 \\ 1 \\ 1 \end{bmatrix}$
- [ ] $\begin{bmatrix} 1 \\ 0 \\ 1 \end{bmatrix}$
- [ ] $\begin{bmatrix} 1 \\ 1 \\ 0 \end{bmatrix}$

Correcto

This is a change of basis in 3 dimensions.

4. Are the following vectors linearly independent? **1 / 1 punto**

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

$\mathbf{a} = \begin{bmatrix} 1 \\ 2 \\ -1 \end{bmatrix}$, $\mathbf{b} = \begin{bmatrix} 3 \\ -4 \\ 5 \end{bmatrix}$ and $\mathbf{c} = \begin{bmatrix} 1 \\ -8 \\ 7 \end{bmatrix}$.

- ○ Yes
- ◉ No

✓ **Correcto**

One can be written as a linear combination of the other two.

5. At 12:00 pm, a spaceship is at position **1 / 1 punto**

$$\begin{bmatrix} 3 \\ 2 \\ 4 \end{bmatrix}$$

km $\begin{bmatrix} 3 \\ 2 \\ 4 \end{bmatrix} km$ away from the origin with respect to some 3 dimensional co

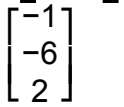
ordinate system. The ship is travelling with velocity $\begin{bmatrix} -1 \\ 2 \\ -3 \end{bmatrix} km/h$ What is the

location of the spaceship after 2 hours have passed?

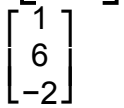
- ○ $\begin{bmatrix} 2 \\ 4 \\ 1 \end{bmatrix}$

$\begin{bmatrix} 2 \\ 4 \\ 1 \end{bmatrix}$

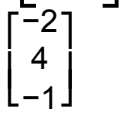
- $\begin{bmatrix} -1 \\ -6 \\ 2 \end{bmatrix}$



- $\begin{bmatrix} 1 \\ 6 \\ -2 \end{bmatrix}$



- $\begin{bmatrix} -2 \\ 4 \\ -1 \end{bmatrix}$



Correcto

This takes the idea of vectors in the context of a moving body.