Vector operations assessment

LATEST SUBMISSION GRADE

100%

1.Question 1

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

A ship travels with velocity given by [1 2], with current flowing in the direction given by [1 1] with respect to some co-ordinate axes.

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

- [2/3 3/2]
- [3/2 3/2]
- [3/2 2/3]
- [2/32/3]

1 / 1 point

2.Question 2

A ball travels with velocity given by [2 1], with wind blowing in the direction given by [3 −4] with respect to some co-ordinate axes.

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

- 2/5
- 5/2
- −5/2
- −2/5

1 / 1 point

3.Question 3

Given vectors v=⎡⎣⎢−4 −3 8⎤⎦⎥, b1=⎡⎣⎢1 2 3⎤⎦⎥, b2=⎡⎣⎢−2 1 0⎤⎦⎥ and b3=⎡⎣⎢−3 −6 5⎤⎦⎥ all written in the standard basis, what is v in the basis defined by b1, b2 and b3? You are given that b1, b2 and b3 are all pairwise orthogonal to each other.

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

1 / 1 point

4.Question 4

Are the following vectors linearly independent?

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

- Yes
- No

1 / 1 point

5.Question 5

At 12:00 pm, a spaceship is at position $\begin{bmatrix}3 & 2 & 4\end{bmatrix}$*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?

- $\begin{bmatrix}2 & 4 & 1\end{bmatrix}$
- $\begin{bmatrix}1 & 6 & -2\end{bmatrix}$
- $\begin{bmatrix}-1 & -6 & 2\end{bmatrix}$
- $\begin{bmatrix}-2 & 4 & -1\end{bmatrix}$