Quiz #6 : Vector and Matrix Operations, Types of Matrices

Question 1

Given the vectors:

$\vec{w} = (0, -1, 2)$ and $\vec{v}$=(1,0,7)

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

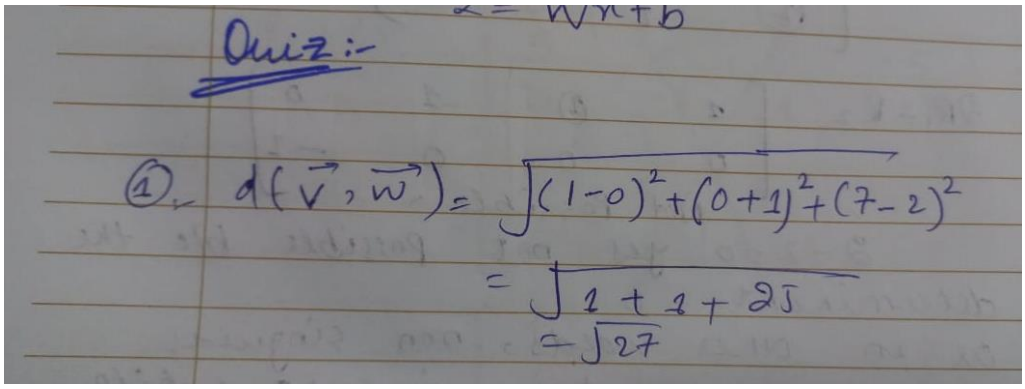
a):- -2

b):- √23

c):- √27

d):- 5

Answer:- c

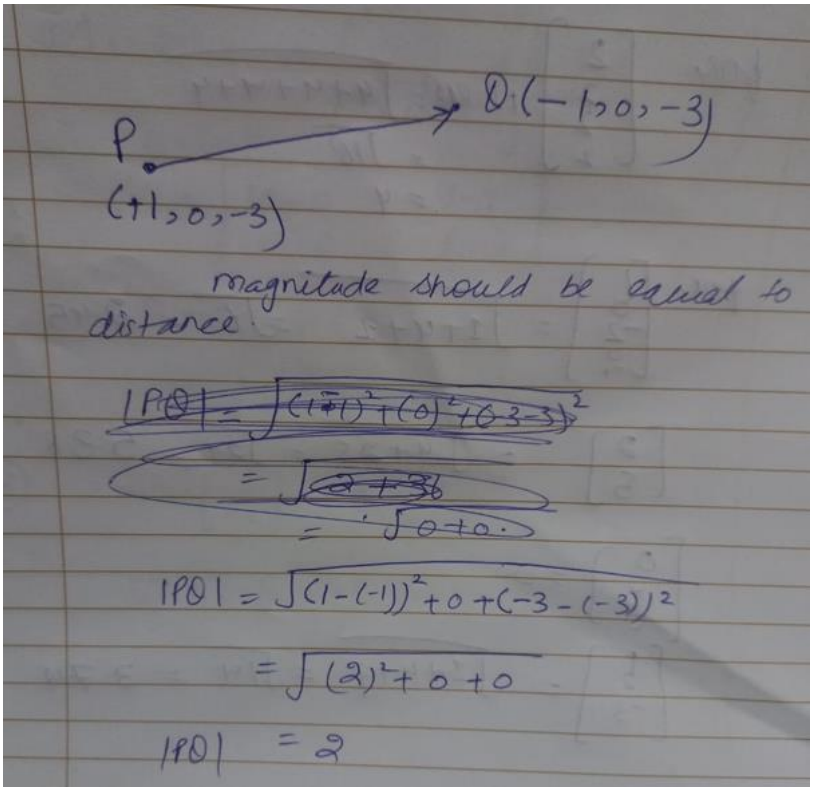


Question 2

You are given the pointsP: (1, 0, -3) andQ: (−1,0,-3). The magnitude of the vector from P to Q is:

a) **3**
b) **-2**
c) **2**

Answer:- c



Question 3

Select the correct statements pertaining to the dot product.

a):- The dot product of orthogonal vectors is always 0.

b):- The dot product of two vectors is always a scalar

c):- The dot product vector is the diagonal in a parallelogram formed by the two vectors $\vec{u}$ and $\vec{v}$

d):- The dot product of orthogonal vectors is always 1.

Answer:- a,b

Question 4

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

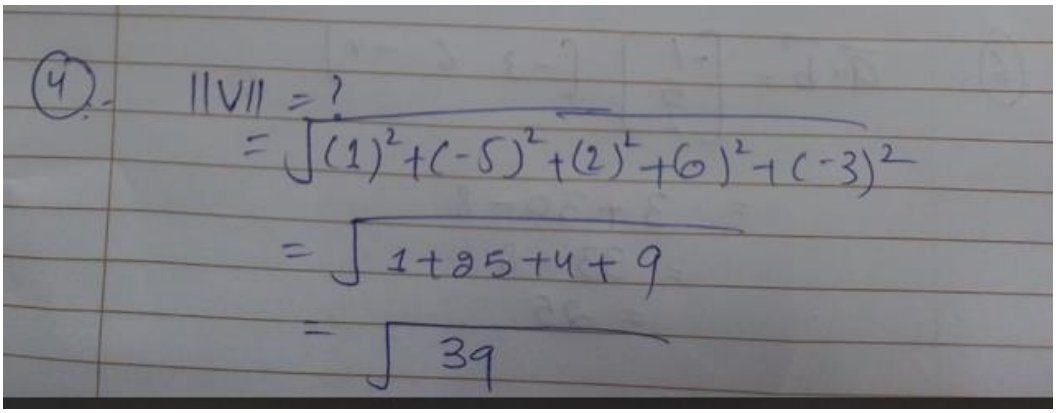
a):- ||v||=39

b):- ||v||=√35

c):- ||v||=√39

d):- ||v||=5

Answer:- c



Question 5

Which of the vectors has the greatest norm?

a):-

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

b):-

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

c):-

$$\begin{bmatrix} 2 \\ 5 \end{bmatrix}$$

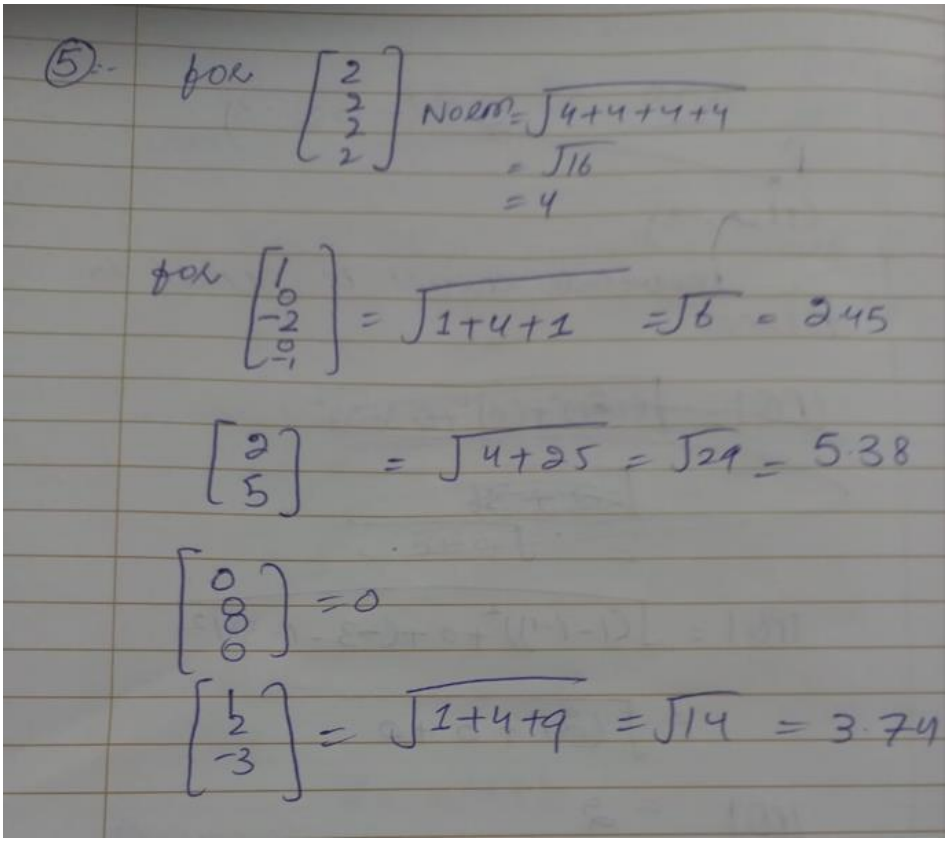
d):-

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

e):-

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

Answer:- c



Question 6

Calculate the dot product $\vec{a}.\vec{b}$, and select the correct answer.

$$\vec{a} = \begin{matrix} -1 \\ 5 \\ 2 \end{matrix}, \vec{b} = \begin{matrix} -3 \\ 6 \\ -4 \end{matrix}$$

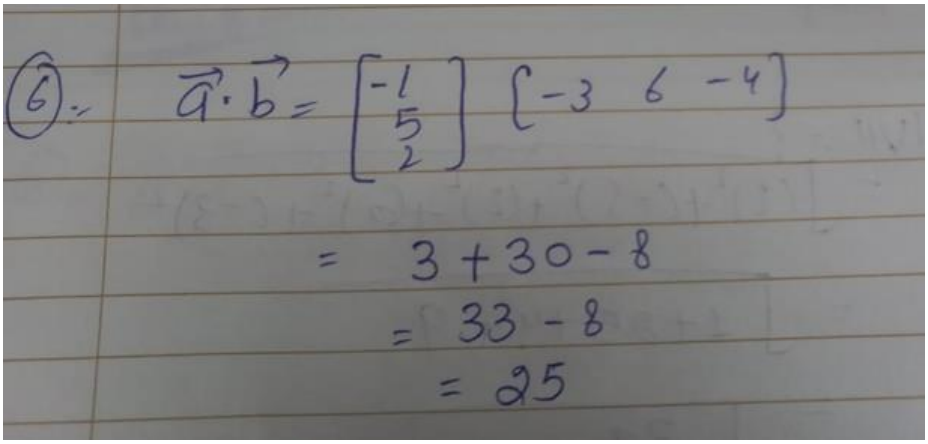
a):- $\begin{matrix} \mathbf{-3} \\ \mathbf{30} \\ \mathbf{-8} \end{matrix}$

b):- 25

c):- 30

d):- $\begin{matrix} \mathbf{1} \\ \mathbf{0} \\ \mathbf{1} \end{matrix}$

Answer:- b



Question 7

Which of the following is the result of performing the multiplication $M_1 . M_2$, where $M_1 = \begin{bmatrix} 2 & -1 \\ 3 & -3 \end{bmatrix}$, $M_2 = \begin{bmatrix} 5 & -2 \\ 0 & 1 \end{bmatrix}$

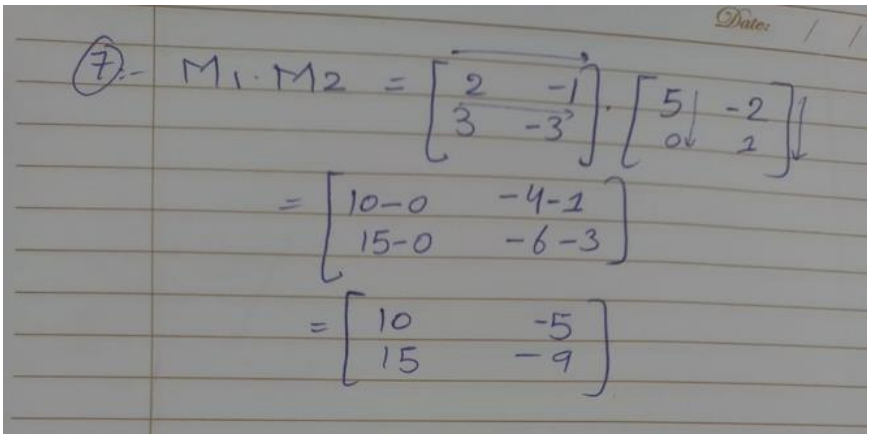
a):- $\begin{bmatrix} 10 & -5 \\ 15 & -9 \end{bmatrix}$

b):- $\begin{matrix} 10 & -3 & 1 \\ 15 & -4 & 0 \\ 1 & 0 & 1 \end{matrix}$

c):- $\begin{bmatrix} 10 & 15 \\ -3 & -4 \end{bmatrix}$

d):- $\begin{bmatrix} 10 & 3 \\ 15 & 4 \end{bmatrix}$

Answer:- a



Question 8

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

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

a):- 35

b):- 32

c):- $\begin{matrix} 27 \\ 5 \end{matrix}$

d):- $\begin{matrix} -27 \\ -5 \end{matrix}$

Answer:- b

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

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

$$= 27 + 5$$

$$= 32$$