Linear Algebra Quiz

Started: May 14 at 10:40am

Quiz Instructions

You are given a quiz to test your understanding of concepts covered in week 1. The quiz will gauge your knowledge of:

- The magnitude and angle direction of Vectors cover dot product operations
- Matrix operations multiplication and Inverse operations of a matrix

It is expected that the quiz will take you 15-20 minutes to complete

Question 1 2 pts

Let's think about the following question:

Will a set of two linear equations with two unknowns always have a solution? And if so, will it always be a single solution?

Consider the following set of equations:

$$\begin{cases} 2a & + & 3b & = & -1 \\ 10a & + & 15b & = & -5 \end{cases}$$

Hint: Try to sketch them graphically. What do you see? How many points of intersection are there? How many points on the line (depicted by the blue x) satisfy the equation? Easier to imagine a as the y axis and b as the x axis so that eqn 1 is 2y + 3 x = -1

- ○ No Solutions Exist
- ○ a=2,b=0
- ○ a=0, b=0
- ◉ Infinite number of solutions

Question 2 2 pts

$$\vec{x} = \begin{bmatrix} 5 \\ 1 \end{bmatrix}$$

$$\vec{y} = \begin{bmatrix} -4 \\ -1 \end{bmatrix}$$

What is the magnitude and direction of $\vec{x} + \vec{y}$?

Hint After finishing the addition, Plot to visualize (Direction is the angle between)

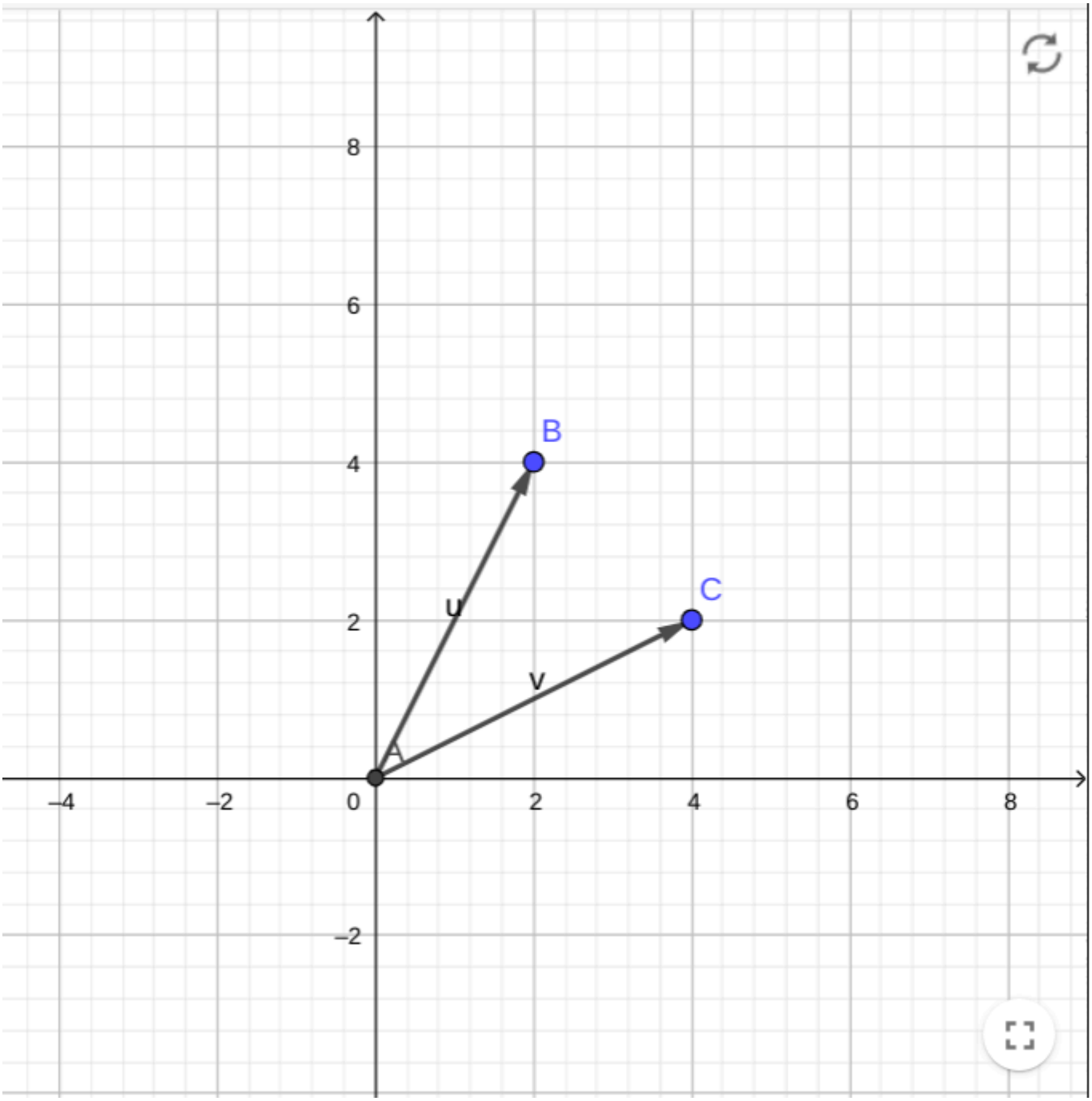
- Maginitude: 4 , Direction: 0 Degrees
- Maginitude: 1 , Direction: 0 Degrees
- No solutions
- Maginitude: 10, Direction: 0 Degrees

Question 3 3 pts

Find the angle between these two vectors u and v:

Remember:

a · b = |a| × |b| × cos(θ) is the same as **a · b** = $a_x \times b_x + a_y \times b_y$



36.9

Question 4 1 pts

What is the name given to such kind of a matrix?

$$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$$

Identity Matrix

Null Matrix

Row Matrix

Determinant

Question 5 3 pts

Calculate the product of the matrix and determine the answer that represents your solution

$$A = \begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix} \times \begin{pmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \end{pmatrix}$$

Solution is same as the 2nd Matrix

An Identity Matrix is the result

I do not know

The solution is an inverse of the 2nd matrixanges

Question 6 2 pts

Find the determinant of the matrix below :

$$\begin{pmatrix} 1 & 2 \\ 4 & 5 \end{pmatrix}$$

-6

-3

3

6

Question 7 0 pts

Find the value of a and b given the equation below:

$$\begin{pmatrix} 1 & 2 \\ 4 & 5 \end{pmatrix} \times \begin{pmatrix} a \\ b \end{pmatrix} = \begin{pmatrix} 9 \\ 7 \end{pmatrix}$$

○ r=[1, 2]

◉ [-31/3, 29/3]

○ r=[3/ 5 , 3 /7]

No new data to save. Last checked at 10:53am Submit Quiz