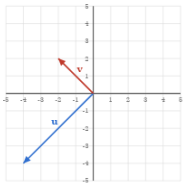
Name

Determine normal vectors to planes

1

Find the direction of the cross product of the two vectors shown.



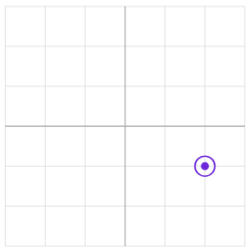
A Into the page

B Out of the page

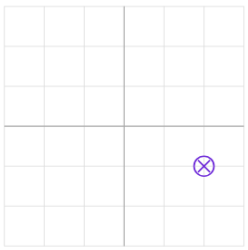
2

Into the page

A

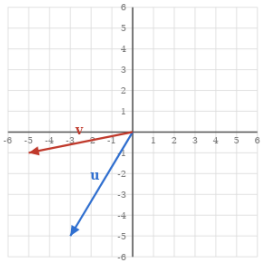


B



3

Find the direction of the cross product of the two vectors shown.



A

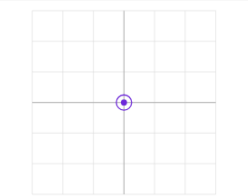
B

4

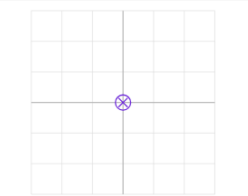
Find the direction of the cross product of the two vectors shown.

$\vec{u} = [-2,\ 4,\ 0]$ $\vec{v} = [5,\ -5,\ 0]$

A



B



5

Find a vector perpendicular to both lines.

$$\vec{r} = \begin{pmatrix} -4 \\ -2 \\ -4 \end{pmatrix} + t \begin{pmatrix} 3 \\ -3 \\ 4 \end{pmatrix}$$

$$\vec{r} = \begin{pmatrix} -2 \\ 1 \\ -3 \end{pmatrix} + t \begin{pmatrix} 2 \\ -1 \\ 4 \end{pmatrix}$$

A $\begin{pmatrix} 5 \\ -4 \\ 8 \end{pmatrix}$

B $\begin{pmatrix} 1 \\ -2 \\ 0 \end{pmatrix}$

C $\begin{pmatrix} -8 \\ -4 \\ 3 \end{pmatrix}$

D $\begin{pmatrix} 8 \\ -4 \\ 3 \end{pmatrix}$

6

Write a possible scalar equation of a plane with the given normal vector.

$$\vec{n} = \begin{pmatrix} 0 \\ 1 \\ -4 \end{pmatrix}$$

A $+y - 4z = 9$

B $-y + 4z = 9$

C $-4x + z = 9$

D $x - 4z = 9$

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7

Given the normal vectors of two planes, are the planes parallel or coincident?

$$\vec{n_1} = \begin{pmatrix} 2 \\ 2 \\ 3 \end{pmatrix} \quad \vec{n_2} = \begin{pmatrix} 0 \\ 1 \\ -1 \end{pmatrix}$$

A Neither

B Parallel or coincident

8

State the normal vector of the plane.

$$x + y - z = 5$$

A $\begin{pmatrix} -1 \\ -1 \\ 1 \end{pmatrix}$

B $\begin{pmatrix} 1 \\ 1 \\ -1 \end{pmatrix}$

C $\begin{pmatrix} -1 \\ 1 \\ 1 \end{pmatrix}$

D $\begin{pmatrix} 1 \\ 1 \\ 5 \end{pmatrix}$

9

Are the two planes perpendicular?

$$4x - 3y + 4z = 6$$

$$2x - 2y + z = -3$$

A Yes

B No

10

Find the vector equation of the normal line to the plane through the given point.

$$\vec{r} = \begin{pmatrix} -1 \\ 1 \\ -14 \end{pmatrix} + s \begin{pmatrix} 4 \\ 4 \\ 0 \end{pmatrix} + t \begin{pmatrix} -4 \\ 4 \\ -32 \end{pmatrix} \quad \text{Point on plane } (-1,\ 1,\ -14)$$

A $\vec{r} = \begin{pmatrix} -4 \\ 4 \\ 1 \end{pmatrix} + t \begin{pmatrix} -1 \\ 1 \\ -14 \end{pmatrix}$

B $\vec{r} = \begin{pmatrix} -1 \\ 1 \\ -14 \end{pmatrix} + t \begin{pmatrix} 1 \\ 1 \\ 0 \end{pmatrix}$

C $\vec{r} = \begin{pmatrix} -1 \\ 1 \\ -14 \end{pmatrix} + t \begin{pmatrix} -4 \\ 4 \\ 1 \end{pmatrix}$

D $\vec{r} = \begin{pmatrix} -1 \\ 1 \\ -14 \end{pmatrix} + t \begin{pmatrix} -1 \\ 1 \\ -14 \end{pmatrix}$

E $\vec{r} = \begin{pmatrix} -1 \\ 1 \\ -14 \end{pmatrix} + t \begin{pmatrix} 4 \\ 4 \\ 1 \end{pmatrix}$