A

Answer

$\theta = 2.42$

For coordinates A$(0, -3, -2)$, B$(-2,\ 3, -3)$ find:

$|\overrightarrow{AB}|$

B

Answer

$a = -0.852$

A line passes through the point $(3,2)$ and is parallel to the vector $\begin{pmatrix} 2 \\ 1 \end{pmatrix}$.

Find the equation of the line in the form $y = mx + c$.

C

Answer

2

For coordinates A$(0, -3, -2)$, B$(-2, 3, -3)$ find:

A unit vector in the direction $\overrightarrow{AB}$

D

Answer

$$\frac{\sqrt{41}}{41}\begin{pmatrix}-2\\6\\-1\end{pmatrix}$$

A ship travels parallel to the vector $\begin{pmatrix}2km\\3km\end{pmatrix}$.

Find a velocity vector for the ship if it travels at 5 km/s.

E

Answer

$2 - 2a$

$\overrightarrow{OA} = \begin{pmatrix} 2 \\ 1 \\ -1 \end{pmatrix}$ $\overrightarrow{OB} = \begin{pmatrix} -1 \\ 0 \\ 2 \end{pmatrix}$.

Find $\overrightarrow{AB}$

F

Answer

$(3, 3, -1)$

Find a vector of length 5 parallel to:

$$\begin{pmatrix} 3cos\theta \\ 3sin\theta \end{pmatrix}.$$

G

Answer

$$0.5a - b + 0.5c$$

$$\overrightarrow{OA} = \begin{pmatrix} 2 \\ 1 \\ -1 \end{pmatrix} \quad \overrightarrow{OB} = \begin{pmatrix} -1 \\ 0 \\ 2 \end{pmatrix}.$$

The point C is such that $\overrightarrow{AC} = \begin{pmatrix} 1 \\ 2 \\ 0 \end{pmatrix}$. Find the coordinates of C.

H

Answer

$$\sqrt{41}$$

For the following 2 vectors:

$$\boldsymbol{u} = \begin{pmatrix} 3 \\ 5 \\ -1 \end{pmatrix}, \ \boldsymbol{v} = \begin{pmatrix} -2 \\ 1 \\ -3 \end{pmatrix}$$

Find $\boldsymbol{u} \cdot \boldsymbol{v}$

I

Answer

1

For the following 2 vectors:

$$\boldsymbol{u} = \begin{pmatrix} 3 \\ 5 \\ -1 \end{pmatrix}, \ \boldsymbol{v} = \begin{pmatrix} -2 \\ 1 \\ -3 \end{pmatrix}$$

Find the angle (in radians) between the 2 vectors.

J

Answer

$$\frac{5}{3}\begin{pmatrix}3cos\theta\\3sin\theta\end{pmatrix}$$

For the following 2 vectors:

$$\boldsymbol{u} = 2\boldsymbol{i} + 3\boldsymbol{j} + a\boldsymbol{k}, \quad \boldsymbol{v} = \boldsymbol{i} - 2\boldsymbol{k}.$$

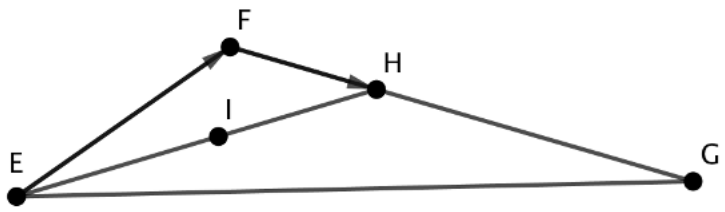
Find $\boldsymbol{u} \cdot \boldsymbol{v}$

K

Answer

$$a = \frac{2 - \sqrt{5}}{2}$$

For triangle EFG, $\overrightarrow{EF}$ = **a** , $\overrightarrow{FH}$ =**b**. I is the midpoint of EH and FH:HG = 1:4.



Find $\overrightarrow{IG}$

L

Answer

$$\begin{pmatrix} -3 \\ -1 \\ 3 \end{pmatrix}$$

For the following 2 vectors:

$$\boldsymbol{u} = 2\boldsymbol{i} + 3\boldsymbol{j} + a\boldsymbol{k}, \quad \boldsymbol{v} = \boldsymbol{i} - 2\boldsymbol{k}.$$

Find a when $\boldsymbol{u} \cdot \boldsymbol{v} = |\boldsymbol{v}|$

Leave your answer in exact form.

M

Answer

$$\frac{5\sqrt{13}}{13}\begin{pmatrix}2\\3\end{pmatrix}$$

For the following 2 vectors:

$$\boldsymbol{u} = 2\boldsymbol{i} + 3\boldsymbol{j} + a\boldsymbol{k}, \quad \boldsymbol{v} = \boldsymbol{i} - 2\boldsymbol{k}.$$

Find a when $\boldsymbol{u} \cdot \boldsymbol{v} = |\boldsymbol{u}|$

N

Answer

$\theta = 1.48$

Find the angle between the vectors

$\boldsymbol{a} = \boldsymbol{i} - \boldsymbol{j} + 3\boldsymbol{k}, \quad \boldsymbol{b} = \boldsymbol{3j} - 2\boldsymbol{k}.$

O

Answer

$0.5a + 4.5b$

A triangle has vertices at $A(1,1)$, $B(3,4)$, $C(6,-2)$.

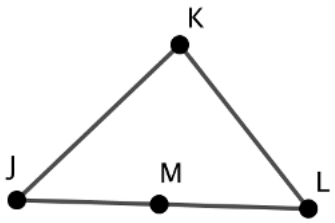
Find $\overrightarrow{AB} \cdot \overrightarrow{AC}$

P

Answer

$$y = 0.5x + 0.5$$

In the triangle JKL, the position vector of J is **a**, the position vector of K is **b** and the position vector of L is **c**. M is the midpoint of JL.



Find $\overrightarrow{KM}$.