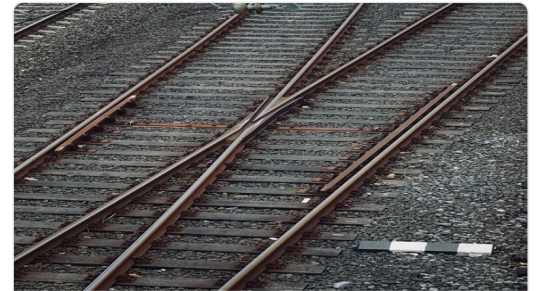


حول المتجه



دورة المتجهات

دورة

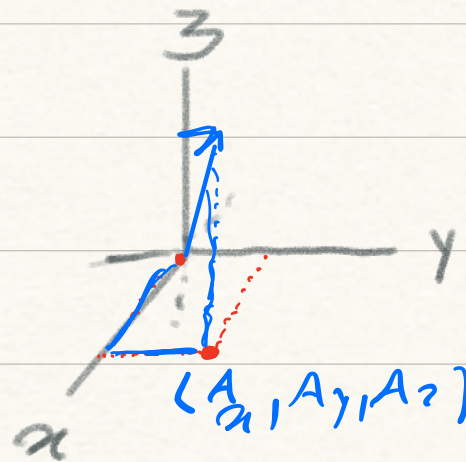
دورة • بواسطة محمد الشهراني

اكتشف المزيد

$$\vec{A} = (A_x, A_y, A_z)$$

$$\vec{A} = (A_x \hat{i} + A_y \hat{j} + A_z \hat{k})$$

$$\vec{A} = A_x \hat{e}_x + A_y \hat{e}_y + A_z \hat{e}_z$$



$$\vec{A} + \vec{B} = [A_x + B_x] \hat{e}_x + [A_y + B_y] \hat{e}_y + [A_z + B_z] \hat{e}_z$$

Example 1

$$\text{let } \vec{A} = \hat{e}_x + 2\hat{e}_y + 6\hat{e}_z$$

$$\vec{B} = 4\hat{e}_x + 2\hat{e}_y - \hat{e}_z$$

find $\vec{A} + \vec{B}$

$$\vec{A} + \vec{B} = 5\hat{e}_x + 4\hat{e}_y + 5\hat{e}_z = \vec{C}$$

Null vector

$$\vec{0} = 0\hat{e}_x + 0\hat{e}_y + 0\hat{e}_z = 0$$

- $\vec{A} + \vec{B} = \vec{B} + \vec{A}$

- $(\vec{A} + \vec{B}) + \vec{C} = \vec{A} + (\vec{B} + \vec{C})$

- $n(\vec{A} + \vec{B}) = n\vec{A} + n\vec{B}$

لوكلام لدينا ثلاث
متجهات $\vec{A}, \vec{B}, \vec{C}$
دقيقه عدد n
طانه

Example 2

if $n=2$

$$\vec{A} = 3\hat{e}_x + 5\hat{e}_y + \hat{e}_z$$

find $n\vec{A}$

$$n\vec{A} = 2(3\hat{e}_x + 5\hat{e}_y + \hat{e}_z)$$
$$n\vec{A} = 6\hat{e}_x + 10\hat{e}_y + 2\hat{e}_z$$

الحل

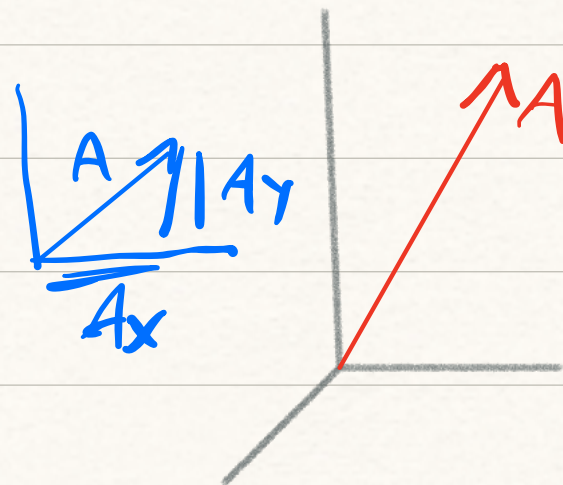
magnitude of any vector.

$$\text{if } \vec{A} = A_x \hat{e}_x + A_y \hat{e}_y + A_z \hat{e}_z$$

find A ?

$$|A| = \sqrt{(A_x \hat{e}_x)^2 + (A_y \hat{e}_y)^2 + (A_z \hat{e}_z)^2}$$

$$|A| = \sqrt{(A_x)^2 + (A_y)^2 + (A_z)^2}$$



$$|A| = \sqrt{(A_x)^2 + (A_y)^2}$$

unit vector

$$\left. \begin{array}{l} \hat{i} \cdot \hat{i} = 1 \\ \hat{j} \cdot \hat{j} = 1 \\ \hat{k} \cdot \hat{k} = 1 \end{array} \right\} \begin{array}{l} \hat{e}_x = \hat{i} \\ \hat{e}_y = \hat{j} \\ \hat{e}_z = \hat{k} \end{array}$$

Example 3

if $\vec{A} = (4, 1, 1)$: $\vec{B} = (2, -1, 5)$ $\rightarrow -\vec{B} = -2\hat{i} + \hat{j} - 5\hat{k}$
find the sum & the magnitude
of the sum, & the expression of the
difference in $\hat{i}, \hat{j}, \hat{k}$

$$\vec{A} + \vec{B} = (3, 0, 6) = \vec{C}$$

$$|\vec{C}| = \sqrt{(3)^2 + (0)^2 + (6)^2} = \sqrt{45}$$

$$\vec{A} - \vec{B} = \vec{A} + (-\vec{B})$$

$$\vec{A} = \hat{i} + \hat{j} + \hat{k}$$

$$-\vec{B} = -2\hat{i} + \hat{j} - 5\hat{k}$$

$$\vec{A} + (-\vec{B}) = -\hat{i} + 2\hat{j} - 4\hat{k}$$

$$\vec{A} - \vec{B} = \vec{A} + (-\vec{B})$$