PAUTA GUÍA 1 (PARTE 1) EDV Matemáticas I

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P1 Dibuje los vectores $\vec{a} = \begin{pmatrix} 4 \\ 3 \end{pmatrix}$, $\vec{b} = \begin{pmatrix} -3 \\ -4 \end{pmatrix}$, $\vec{c} = \begin{pmatrix} -2 \\ 5 \end{pmatrix}$ ∧ $\vec{d} = ($

Además calcule
$\vec{x} = \vec{a} + \vec{b}$, $\vec{y} = \vec{c} + \vec{d}$, $\vec{z} = \vec{a} + \vec{c}$ ∧ grafíquelos.

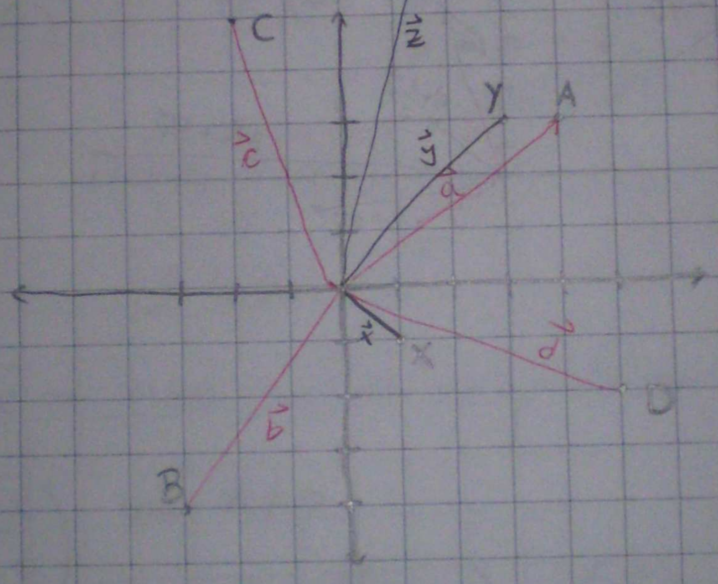
Así

$$\vec{x} = \vec{a} + \vec{b} = \begin{pmatrix} 4 \\ 3 \end{pmatrix} + \begin{pmatrix} -3 \\ -4 \end{pmatrix} = \begin{pmatrix} 4 + (-3) \\ 3 + (-4) \end{pmatrix} = \begin{pmatrix} 1 \\ -1 \end{pmatrix}$$

$$\vec{y} = \vec{c} + \vec{d} = \begin{pmatrix} -2 \\ 5 \end{pmatrix} + \begin{pmatrix} 5 \\ -2 \end{pmatrix} = \begin{pmatrix} -2 + 5 \\ 5 + (-2) \end{pmatrix} = \begin{pmatrix} 3 \\ 3 \end{pmatrix}$$

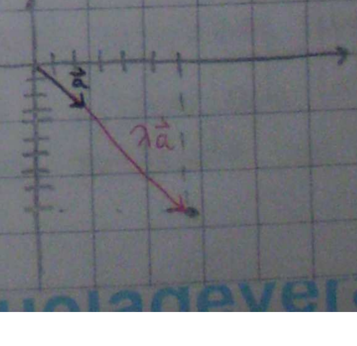
$$\vec{z} = \vec{a} + \vec{c} = \begin{pmatrix} 4 \\ 3 \end{pmatrix} + \begin{pmatrix} -2 \\ 5 \end{pmatrix} = \begin{pmatrix} 4 + (-2) \\ 3 + 5 \end{pmatrix} = \begin{pmatrix} 2 \\ 8 \end{pmatrix}$$

Gráficamente.



P2 si $\vec{a} = \begin{pmatrix} 2 \\ -3 \end{pmatrix}$ ∧ $\lambda = 3$ entonces ¿$\lambda\vec{a}$?, grafique.

$$\lambda\vec{a} = 3\begin{pmatrix} 2 \\ -3 \end{pmatrix} = \begin{pmatrix} 3 \cdot 2 \\ 3 \cdot (-3) \end{pmatrix} = \begin{pmatrix} 6 \\ -9 \end{pmatrix}$$



GENERAN un empuje $\vec{e} = \alpha\vec{a} + \beta\vec{b}$

P3 si $\vec{u} = \begin{pmatrix} 1 \\ 3 \end{pmatrix}$; $\vec{v} = \begin{pmatrix} 3 \\ -2 \end{pmatrix}$

GRAFIQUE : $\vec{u}, \vec{v}, 2\vec{u}, -4\vec{v}, \vec{u}+2\vec{v}, \vec{u}+\frac{1}{2}\vec{v}, 3\vec{u}+4\vec{v}$

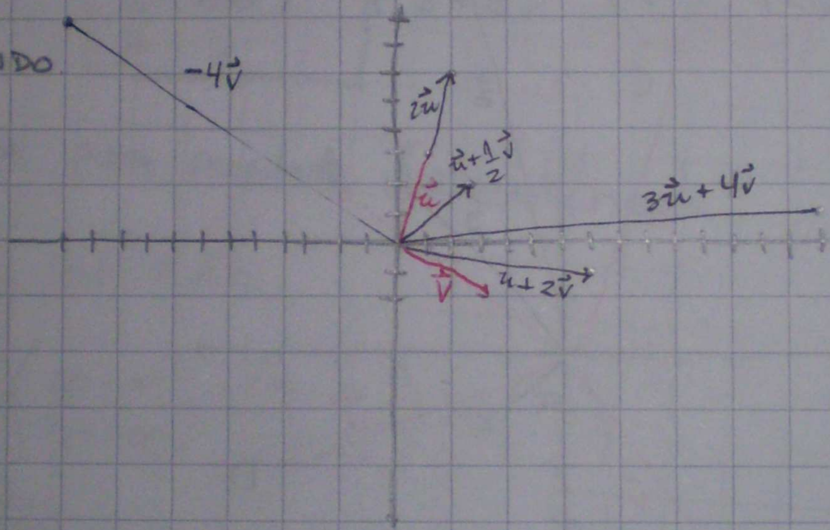
$$2\vec{u} = 2\begin{pmatrix} 1 \\ 3 \end{pmatrix} = \begin{pmatrix} 2\cdot 1 \\ 2\cdot 3 \end{pmatrix} = \begin{pmatrix} 2 \\ 6 \end{pmatrix} // \quad ; \quad -4\vec{v} = -4\begin{pmatrix} 3 \\ -2 \end{pmatrix} = \begin{pmatrix} -4\cdot 3 \\ -4\cdot(-2) \end{pmatrix} = \begin{pmatrix} -12 \\ 8 \end{pmatrix} //$$

$$\vec{u} + 2\vec{v} = \begin{pmatrix} 1 \\ 3 \end{pmatrix} + 2\begin{pmatrix} 3 \\ -2 \end{pmatrix} = \begin{pmatrix} 1 \\ 3 \end{pmatrix} + \begin{pmatrix} 2\cdot 3 \\ 2\cdot(-2) \end{pmatrix} = \begin{pmatrix} 1 \\ 3 \end{pmatrix} + \begin{pmatrix} 6 \\ -4 \end{pmatrix} = \begin{pmatrix} 1+6 \\ 3+(-4) \end{pmatrix} = \begin{pmatrix} 7 \\ -1 \end{pmatrix}$$

$$\vec{u} + \frac{1}{2}\vec{v} = \begin{pmatrix} 1 \\ 3 \end{pmatrix} + \frac{1}{2}\begin{pmatrix} 3 \\ -2 \end{pmatrix} = \begin{pmatrix} 1 \\ 3 \end{pmatrix} + \begin{pmatrix} \frac{1}{2}\cdot 3 \\ \frac{1}{2}\cdot(-2) \end{pmatrix} = \begin{pmatrix} 1 \\ 3 \end{pmatrix} + \begin{pmatrix} 3/2 \\ -1 \end{pmatrix} = \begin{pmatrix} 1+3/2 \\ 3+(-1) \end{pmatrix} = ($$

$$3\vec{u} + 4\vec{v} = 3\begin{pmatrix} 1 \\ 3 \end{pmatrix} + 4\begin{pmatrix} 3 \\ -2 \end{pmatrix} = \begin{pmatrix} 3\cdot 1 \\ 3\cdot 3 \end{pmatrix} + \begin{pmatrix} 4\cdot 3 \\ 4\cdot(-2) \end{pmatrix} = \begin{pmatrix} 3 \\ 9 \end{pmatrix} + \begin{pmatrix} 12 \\ -8 \end{pmatrix} = \begin{pmatrix} 3+12 \\ 9+(-8) \end{pmatrix} = ($$

GRAFICANDO



P4 (TAREA 1)

COHETE 2 PROPULSIONES $\vec{a} = \begin{pmatrix} -1 \\ -1 \end{pmatrix}$, $\vec{b} = \begin{pmatrix} 2 \\ -1 \end{pmatrix}$

GENERAN UN EMPUJE $\vec{e} = \alpha\vec{a} + \beta\vec{b}$

1.- HALLAR $\vec{e}$ EN FN DE $\alpha \wedge \beta$.

$$\vec{e} = \alpha\vec{a} + \beta\vec{b} = \alpha\begin{pmatrix} -1 \\ -1 \end{pmatrix} + \beta\begin{pmatrix} 2 \\ -1 \end{pmatrix} = \begin{pmatrix} -\alpha \\ -\alpha \end{pmatrix} + \begin{pmatrix} 2\beta \\ -\beta \end{pmatrix} = \begin{pmatrix} 2\beta - \alpha \\ -\beta - \alpha \end{pmatrix} //$$

(2ptos)

2.- ¿α, β? si $\vec{e} = \begin{pmatrix} 0 \\ -6 \end{pmatrix}$

$$\vec{e} = \begin{pmatrix} 2\beta - \alpha \\ -\beta - \alpha \end{pmatrix} = \begin{pmatrix} 0 \\ -6 \end{pmatrix} \Rightarrow \begin{aligned} 2\beta - \alpha &= 0 \\ -\beta - \alpha &= -6 \quad / \cdot -1 \end{aligned}$$

$$\begin{aligned} 2\beta - \alpha &= 0 \\ (*)\ \beta + \alpha &= 6 \quad (+) \\ 3\beta &= 6 \\ \boxed{\beta = 2} \end{aligned}$$

DE (*) $\beta + \alpha = 6$

$2 + \alpha = 6$

$\boxed{\alpha = 4}$

$$\boxed{\begin{array}{l} \text{VALORES SON} \\ \alpha = 4 \\ \beta = 2 \end{array}}$$

(2ptos)

3.- si $\beta = 2$ ¿SE PUEDE PROPULSAR HORIZONTALMENTE?

Propulsión horizontal $\Rightarrow \vec{e} = \begin{pmatrix} X \\ 0 \end{pmatrix}$ con $X \neq 0$.

$$\Rightarrow \vec{e} = \begin{pmatrix} 2\beta - \alpha \\ -\beta - \alpha \end{pmatrix} = \begin{pmatrix} 4 - \alpha \\ -2 - \alpha \end{pmatrix} = \begin{pmatrix} X \\ 0 \end{pmatrix}$$

(2pt

$$\Rightarrow \begin{aligned} 4 - \alpha &= X \\ -2 - \alpha &= 0 \end{aligned}$$

$\boxed{-2 = \alpha}$

$\wedge\ 4 - (-2) = X$

$\boxed{6 = X}$

$\therefore$ SÍ SE PUEDE DESPLAZAR HORIZ

CON $\alpha = -2$ $\wedge$ DADO QUE LA CO

DE X ES DISTINTA DE CE

P5 si $A=(1,1)$; $B=(7,-2)$; $C=(6,5)$; $D=(3,6)$

HALLAR E pto medio AB   G pto medio CD
F pto medio BD   H pto medio AC

GRAFIQUE CUADRILATEROS ABCD , EFGH

COMPRUEBE $\overrightarrow{HG} = \overrightarrow{EF}$
$\overrightarrow{EH} = \overrightarrow{FG}$

DEDUZCA EFGH ES PARALELOGRAMO.

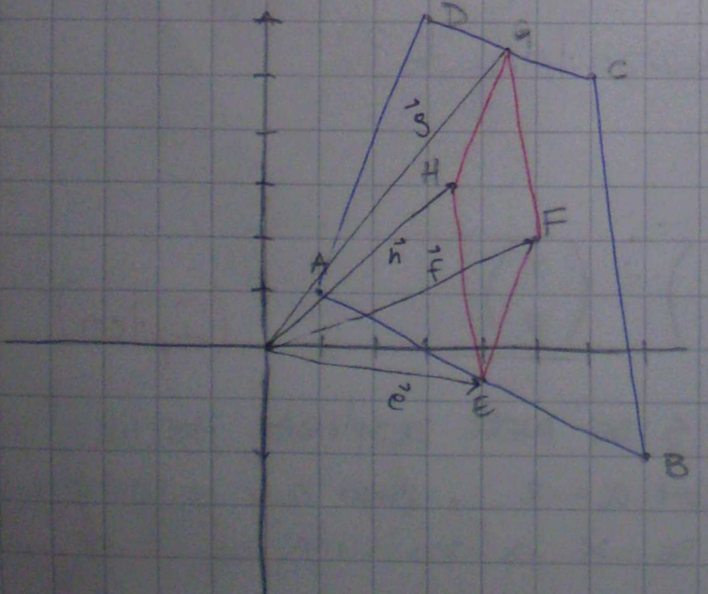
SABEMOS QUE FORMULA pto medio $P_n = \frac{1}{2}(A+B)$

ASÍ $E = \frac{1}{2}\left[(1,1)+(7,-2)\right] = \frac{1}{2}\left[(1+7, 1+(-2))\right] = \frac{1}{2}\left[(8,-1)\right] = \left(4,-\right.$

$F = \frac{1}{2}\left[(7,-2)+(3,6)\right] = \frac{1}{2}\left[(7+3,-2+6)\right] = \frac{1}{2}\left[(10,4)\right] = (5,2)$

$G = \frac{1}{2}\left[(6,5)+(3,6)\right] = \frac{1}{2}\left[(6+3,5+6)\right] = \frac{1}{2}\left[(9,11)\right] = \left(\frac{9}{2},\frac{11}{2}\right)$

$H = \frac{1}{2}\left[(1,1)+(6,5)\right] = \frac{1}{2}\left[(1+6,1+5)\right] = \frac{1}{2}\left[(7,6)\right] = \left(\frac{7}{2},3\right)$



$\overrightarrow{HG} = \vec{g} - \vec{h} = \begin{pmatrix} 9/2 \\ 11/2 \end{pmatrix} - \begin{pmatrix} 7/2 \\ 3 \end{pmatrix} = \begin{pmatrix} 1 \\ 5/ \end{pmatrix}$

$\overrightarrow{EF} = \vec{f} - \vec{e} = \begin{pmatrix} 5 \\ 2 \end{pmatrix} - \begin{pmatrix} 4 \\ -1/2 \end{pmatrix} = \begin{pmatrix} 1 \\ 5/ \end{pmatrix}$

$\Rightarrow \overrightarrow{HG} = \overrightarrow{EF}$; $\overrightarrow{EH} = \overrightarrow{FG}$ AN

DADO lo ANTERIOR $\overrightarrow{HG} \parallel \overrightarrow{EF} \wedge \overrightarrow{E}$
$\Rightarrow$ EFGH ES UN
PARALELÓGR