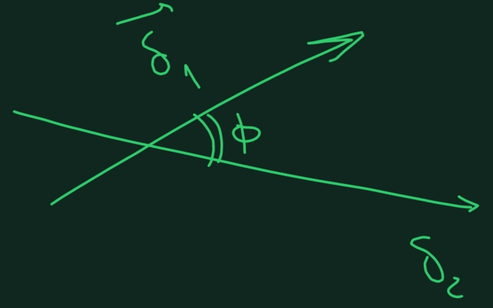
17) $\varepsilon_1 : x - y + 3 = 0$

$\varepsilon_2 : 2x + y = 0$

Εχω $\vec{\delta}_1 // \varepsilon_1 \Leftrightarrow \lambda\vec{\delta}_1 = \lambda_{\varepsilon_1} \Leftrightarrow \lambda_{\vec{\delta}_1} = -\frac{A}{B} \Leftrightarrow$

$\lambda_{\vec{\delta}_1} = -\frac{1}{-1} \Leftrightarrow \boxed{\lambda_{\vec{\delta}_1} = 1}$: $\vec{\delta}_1 = (1, 1)$

Εχω $\vec{\delta}_2 // \varepsilon_2 \Leftrightarrow \lambda\vec{\delta}_2 = \lambda_{\varepsilon_2} \Leftrightarrow \underline{\lambda_{\vec{\delta}_2} = -2}$: $\vec{\delta}_2 = (1, -2)$



$$\sigma\upsilon\nu\hat{\phi} = \frac{\vec{\delta}_1 \cdot \vec{\delta}_2}{|\vec{\delta}_1| \cdot |\vec{\delta}_2|} = \frac{1 \cdot 1 + 1 \cdot (-2)}{\sqrt{1^2 + 1^2} \cdot \sqrt{1^2 + (-2)^2}} = \frac{1 - 2}{\sqrt{2} \cdot \sqrt{5}} = \frac{-1}{\sqrt{10}}$$

$$\Longrightarrow \boxed{\sigma\upsilon\nu\hat{\phi} = -\frac{\sqrt{10}}{10}}$$

18) $\varepsilon_1 : x - 3y + 5 = 0$

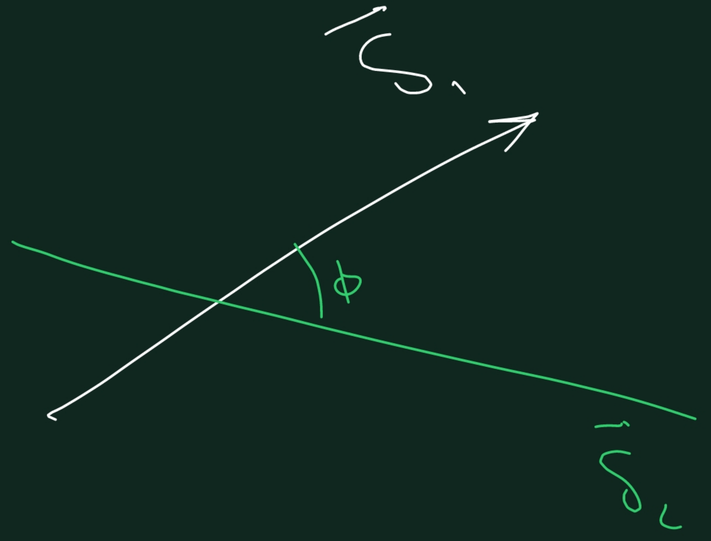
$\varepsilon_2 : x + 2y = 0$

Έστω $\vec{\delta}_1 \parallel \varepsilon_1 \Leftrightarrow \lambda_{\vec{\delta}_1} = \lambda_{\varepsilon_1} \Leftrightarrow \lambda_{\vec{\delta}_1} = \frac{1}{3}$

$\vec{\delta}_1 = (1, 3)$

Έστω $\vec{\delta}_2 \parallel \varepsilon_2 \Leftrightarrow \lambda_{\vec{\delta}_2} = \lambda_{\varepsilon_2} \Leftrightarrow \lambda_{\vec{\delta}_2} = -\frac{1}{2}$:

$\vec{\delta}_2 = (-2, 1)$



$$\sigma\upsilon\nu\hat{\phi} = \frac{\vec{\delta}_1 \cdot \vec{\delta}_2}{|\vec{\delta}_1| \cdot |\vec{\delta}_2|} = \frac{1 \cdot (-2) + 3 \cdot 1}{\sqrt{1^2 + 3^2} \cdot \sqrt{(-2)^2 + 1^2}} = \frac{-2 + 3}{\sqrt{10} \cdot \sqrt{5}} =$$

$$\frac{1}{\sqrt{50}} = \frac{1}{\sqrt{25 \cdot 2}} = \frac{1}{5 \cdot \sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{\sqrt{2}}{10} \Rightarrow \boxed{\sigma\upsilon\nu\phi = \frac{\sqrt{2}}{10}}$$

14) ΝΑΟ $y^2 - x^2 = 0$ Παριστάνει ζεύγος ευθειών. Ποια είναι η σχετική τους θέση;

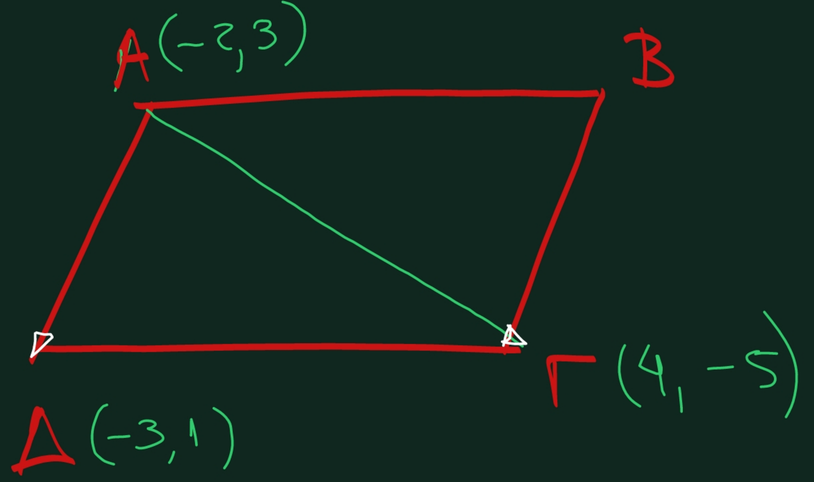
$(y+x)(y-x) = 0 \Leftrightarrow y+x=0$ ή $y-x=0 \Leftrightarrow$

$\varepsilon_1 : y = -x$ | $\varepsilon : y = x$

$\lambda_1 = -1$ $\lambda_2 = 1$

Εχω $\lambda_1 \cdot \lambda_2 = -1 \Leftrightarrow$ $\varepsilon_1 \perp \varepsilon_2$

10
5.75



$E = ;$

$Εμβ\ (ABΓΔ) = 2(AΔΓ) =$

$2 \cdot \frac{1}{2} \cdot \left| \det(\vec{AΔ}, \vec{AΓ}) \right| =$

$\left| \begin{vmatrix} -1 & -2 \\ 6 & -8 \end{vmatrix} \right| =$

$\left| -8 \cdot (-1) - 6 \cdot (-2) \right| = \left| 8 + 12 \right|$

$= |20| = 20 \Rightarrow$

$(ABΓΔ) = 20\ τ.μ$

- $\vec{AΔ} = (-3-(-2), 1-3) = (-1, -2)$
- $\vec{AΓ} = (4-(-2), -5-3) = (6, -8)$

(B) 1) Να βρεθεί ε: Που διερχ $O(0,0)$ και ισαπέχει από τα $A(-2,0)$, $B(0,2)$

σ.ζ.σ

ε: διερχ $O \Longleftrightarrow \varepsilon: y = \lambda x \Leftrightarrow$ **$\varepsilon: \lambda x - y = 0$**

ε: ισαπέχει $A, B \Leftrightarrow d(\varepsilon, A) = d(\varepsilon, B) \Leftrightarrow$

$$\frac{|\lambda\cdot(-2) - 1\cdot 0 + 0|}{\sqrt{\lambda^2 + (-1)^2}} = \frac{|\lambda\cdot 0 - 1\cdot 2 + 0|}{\sqrt{\lambda^2 + (-1)^2}} \Leftrightarrow \frac{|-2\lambda|}{\sqrt{\lambda^2+1}} = \frac{|-2|}{\sqrt{\lambda^2+1}} \quad \cdot\sqrt{\lambda^2+1} \Leftrightarrow$$

$$|-2\lambda| = 2 \Leftrightarrow -2\lambda = 2 \text{ ή } -2\lambda = -2$$

$\lambda = -1$	$\lambda = 1$
$\varepsilon_1: y = -x$	$\varepsilon_2: y = x$

Β2 σ.75 | Να βρεθεί το Μ σημείο του $x'x$ το οποίο ισαπέχει από το O και από την $\varepsilon: 5x+12y-60=0$

Έχω $M \in x'x \iff M(a,0)$

θέλω $OM = d(M,\varepsilon) \iff |a| = \dfrac{|5\cdot a + 12\cdot 0 - 60|}{\sqrt{5^2+12^2}} \iff$

$|a| = \dfrac{|5a-60|}{\sqrt{25+144}} \iff |a| = \dfrac{|5a-60|}{13} \iff a = \dfrac{5a-60}{13} \iff 13a = 5a - 60 \iff$

$8a = -60 \iff a = -\dfrac{60}{8} \iff a = -15/2$

ή

$a = -\dfrac{5a-60}{13} \iff 13a = -5a + 60 \iff$

$\dfrac{18a}{18} = \dfrac{60}{18} \iff a = \dfrac{10}{3}$

$M_1\left(-\frac{15}{2}, 0\right)$

$M_2\left(\frac{10}{3}, 0\right)$

(B) 5) σ. 76) Να βρεθούν τα σημεία της $\varepsilon: x-y+2=0$ τα οποία ισαπέχουν από τη $\delta: 12x-5y+60=0$, απόσταση ίση με 1.

Έστω $M(a,\beta) \in \varepsilon \Rightarrow \boxed{a-\beta+2=0}$ (1)

Έχω $d(M,\delta)=1 \Leftrightarrow \dfrac{|12a-5\beta+60|}{\sqrt{12^2+(-5)^2}}=1 \Leftrightarrow \dfrac{|12a-5\beta+60|}{\sqrt{144+25}}=1 \Leftrightarrow$

$|12a-5\beta+60|=13 \Leftrightarrow 12a-5\beta+60=13$ ή $12a-5\beta+60=-13$

$\boxed{12a-5\beta=-47}$ (2) | $\boxed{12a-5\beta=-73}$ (3)

(1) $\Leftrightarrow a-\beta=-2$ $\}\cdot(-5)$

(2) $\Leftrightarrow 12a-5\beta=-47$ $\}$ $\Leftrightarrow$

$-5a+5\beta=10$

$12a-5\beta=-47$ $\}+$ $\Rightarrow 7a=-37 \Leftrightarrow$

$\boxed{a=-\frac{37}{7}}$ ...

Άρα $M_1\left(-\frac{37}{7}, -\frac{23}{7}\right)$

(1) $\Leftrightarrow a-\beta=-2$ $\}\cdot(-5)$

(3) $\Leftrightarrow 12a-5\beta=-73$ $\}$ $\Rightarrow$

$-5a+5\beta=10$

$12a-5\beta=-73$ $\}+$ $\Rightarrow$

$7a=-63 \Rightarrow a=-9$

$\boxed{M_2(-9,-7)}$