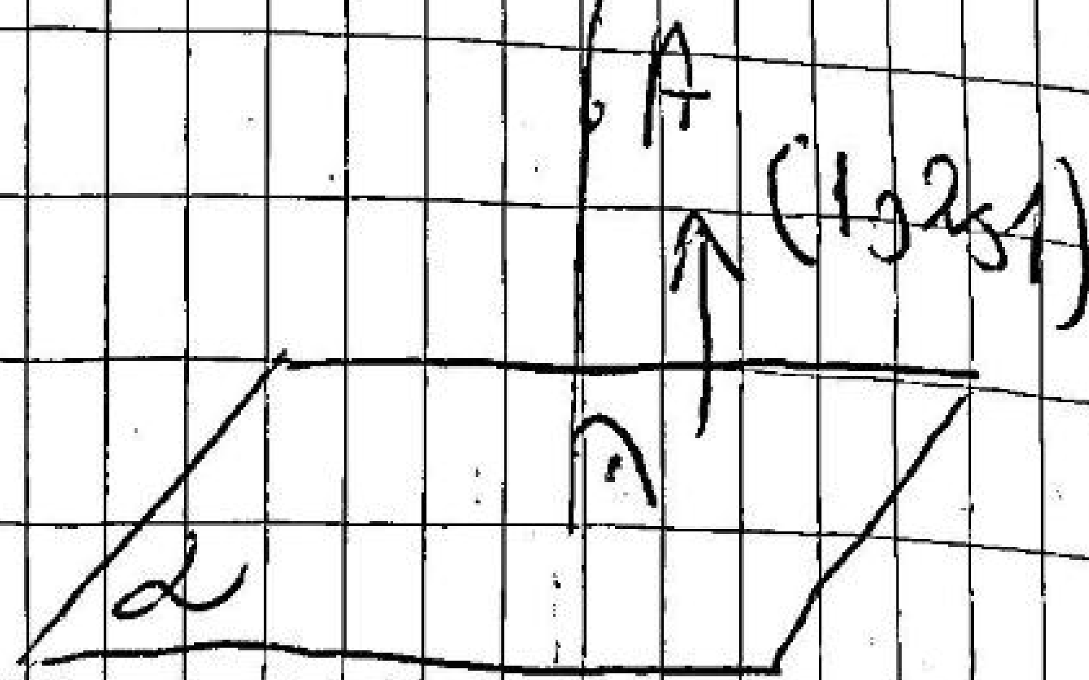
11.03
2022 III седмица. Лекция

зад 1

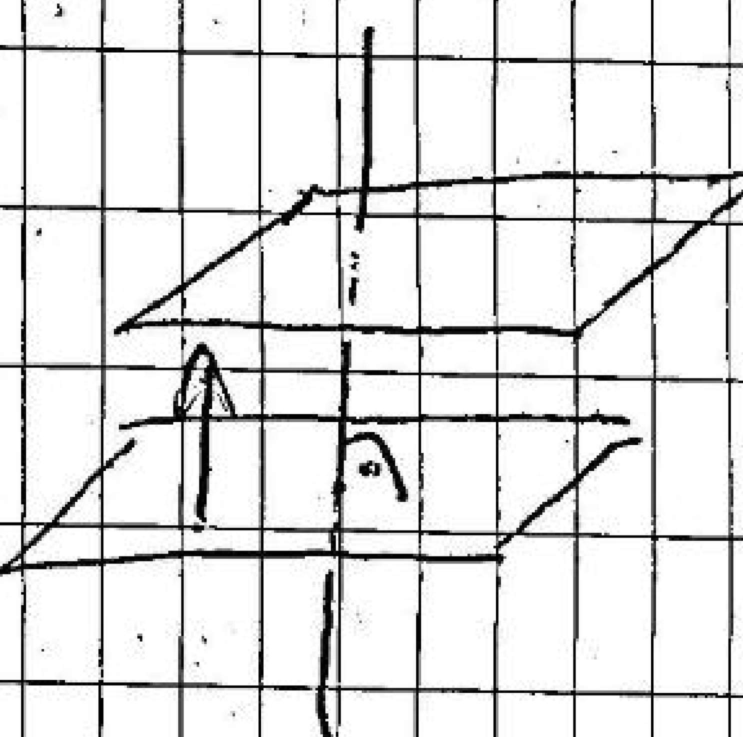


$e: \begin{cases} \ni A(1,2,-1) \\ \perp \alpha: x+2z+1=0 \end{cases}$

$\boxed{e: \ x-1 = \frac{y-2}{0} = \frac{z+1}{2} = t}$

$e: \begin{cases} x = 1+t \\ y = 2+0t \\ z = -1+2t \end{cases}$

зад 2 $\alpha: \begin{cases} \ni A(1,2,3) \\ \parallel \beta: 2x+y+z=0 \end{cases}$

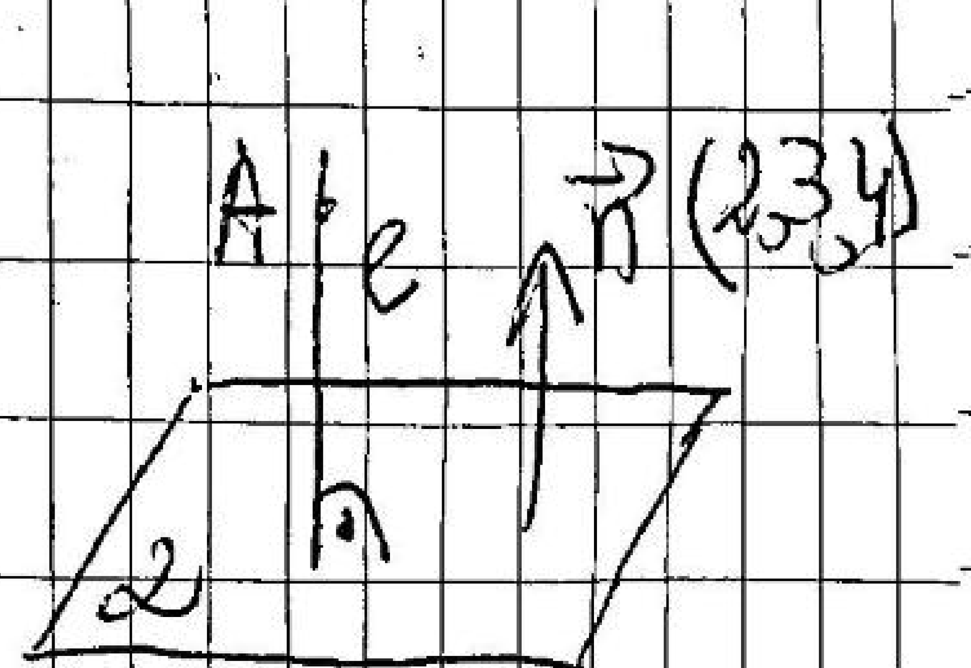


$\alpha: 2(x-1)+1(y-2)+1(z-3)=0$

$2x-2+y-2+z-3=0$

$\boxed{\alpha: 2x+y+z-7=0}$

зад 3 $\alpha: \begin{cases} \ni A(1,-1,2) \\ \perp e: \frac{x-1}{2} = \frac{y-2}{3} = \frac{z+1}{4} \end{cases}$



$\alpha: 2(x-1)+3(y+1)+4(z-2)=0$

$2x-2+3y+3+4z-8=0$

$\boxed{2x+3y+4z-7=0}$

зад 4. Намерете прободът на правата

$e: \dfrac{x-1}{2} = \dfrac{y+1}{2} = \dfrac{z-2}{3}$ с равнината с у-ние

$x-2y-3z+21=0$

$e: \dfrac{x-1}{2} = \dfrac{y+1}{1} = \dfrac{z-2}{3} = t$ $\quad e: \begin{cases} x = 1+2t \\ y = -1+t \\ z = 2+3t \end{cases}$

$1+2t-2(t-1)-3(3t+2)+21=0$

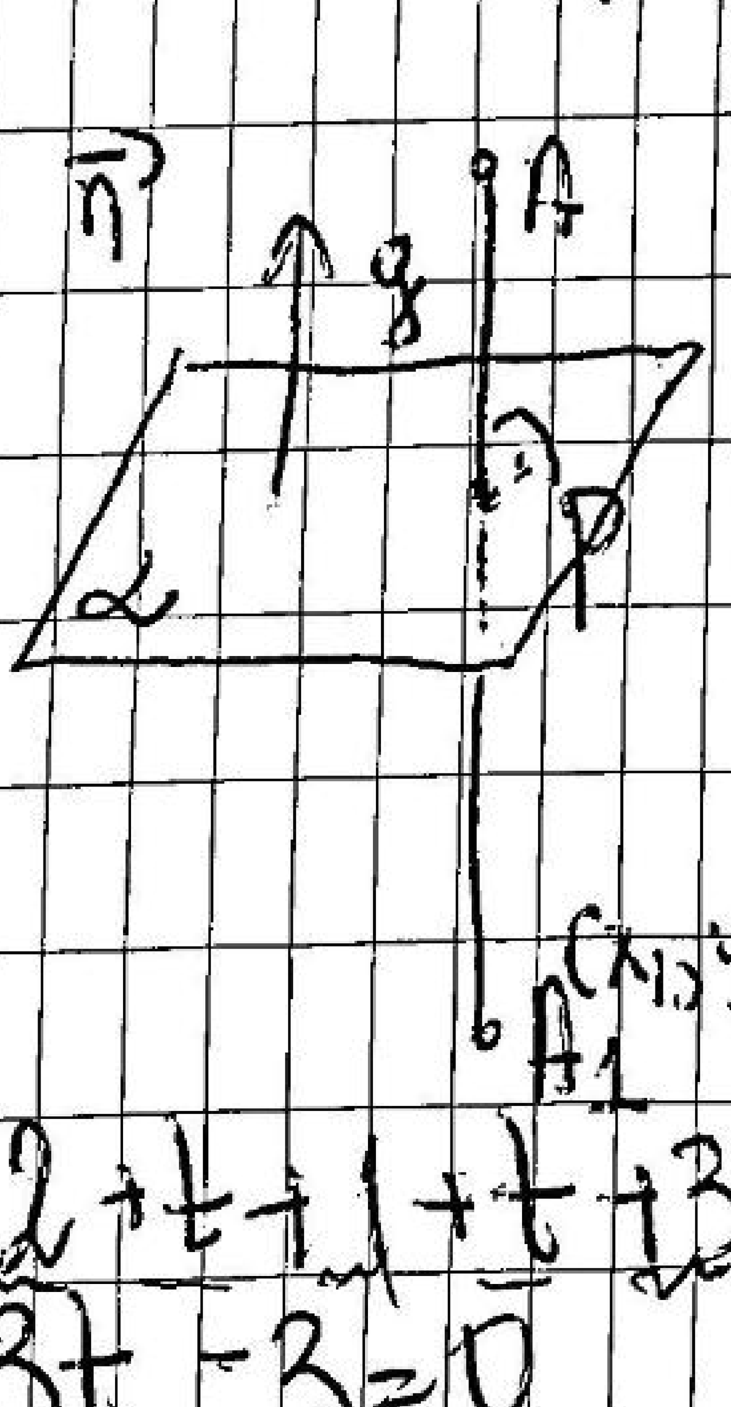
$1+\cancel{2t}-\cancel{2t}+2-9t-6+21=0$

$-\cancel{12}t=-30$ $\quad$ $t=\cancel{\frac{30}{12}}$

$-9t=-18$

$t=2$ $\quad$ $\boxed{P(5,1,8)}$ пробод

зад 5 Да се намерят координатите на проекцията и симетричната точка на точката $A(2,1,3)$ относно равнината $x+y+z-9=0$



$g: \begin{cases} \ni A(2,1,3) \\ \vec{n}(1,1,1) \end{cases}$

$g: \dfrac{x-2}{1} = \dfrac{y-1}{1} = \dfrac{z-3}{1}$ $\quad g: \begin{cases} x = 2+t \\ y = 1+t \\ z = 3+t \end{cases}$

$2+t+1+t+3+t-9=0$ $\quad$ $A_1 \{$

$3t-3=0$

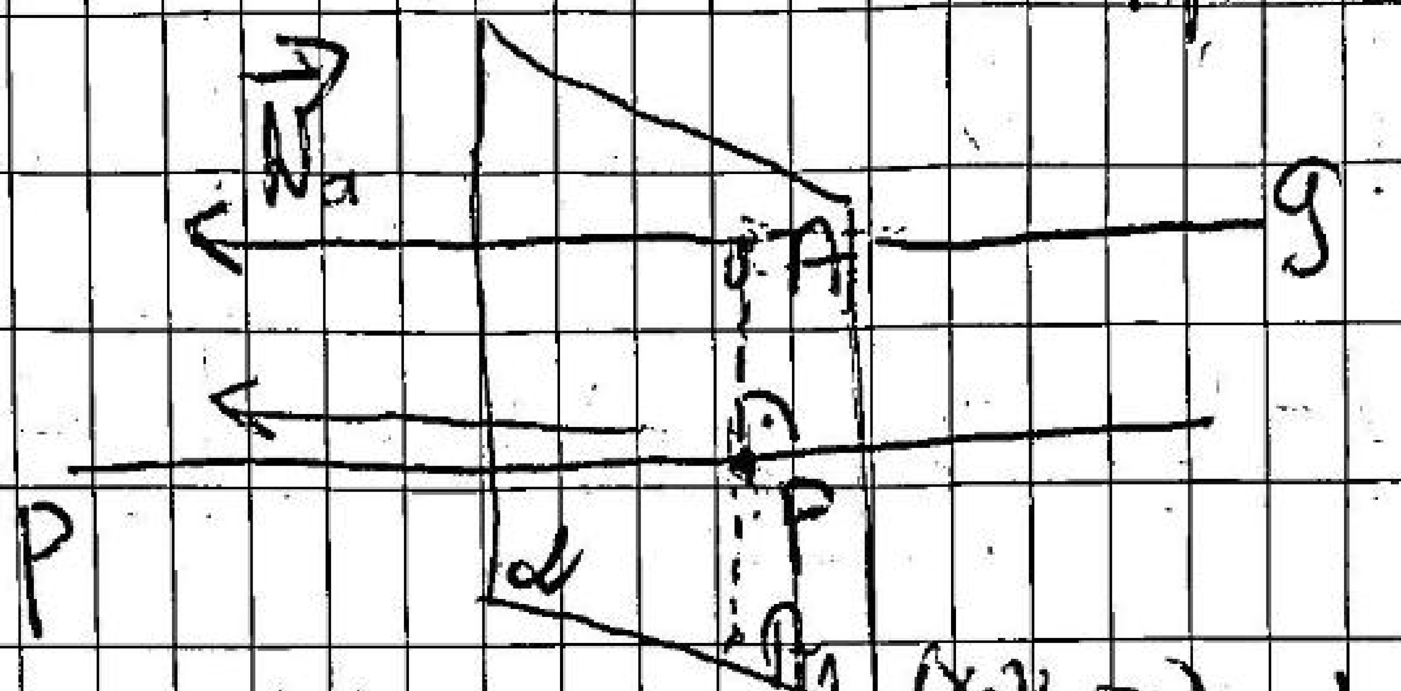
$t=1 \Rightarrow P(3,2,4)$ $\quad P\left(\dfrac{2+x_1}{2}, \dfrac{1+y_1}{2}, \dfrac{3+z_1}{2}\right)$

$\frac{2+x_1}{2}=3 \quad x_1=4 \quad \frac{1+y_1}{2}=2 \quad y_1=3 \quad \frac{3+z_1}{2}=4 \quad z_1=5$

$\boxed{A_1(4,3,5)}$

Зад6. Да се намери ортогонално симетричната точка на точка $A(1,3,0)$ спрямо ~~равнината~~ правата

$p: \frac{x-3}{1}=\frac{y-1}{1}=\frac{z+3}{-1}$



$\alpha \perp p$

~~$\left(g: \begin{cases} \ni A(1,3,0) \\ \vec{n}(1,1,-1) \end{cases}\right)$~~

~~$\left(g: \frac{x-1}{1}=\frac{y-3}{1}=\frac{z}{-1} \quad g: \begin{cases} x=1+t \\ y=3+t \\ z=0-t \end{cases}\right)$~~

1) $\alpha: \begin{cases} \ni A(1,3,0) \\ \vec{n}(1,1,-1) \end{cases} \quad \alpha: (x-1)+(y-3)-(z)=$

$= x-1+y-3-z=0$

$\boxed{\alpha: x+y-z-4=0}$

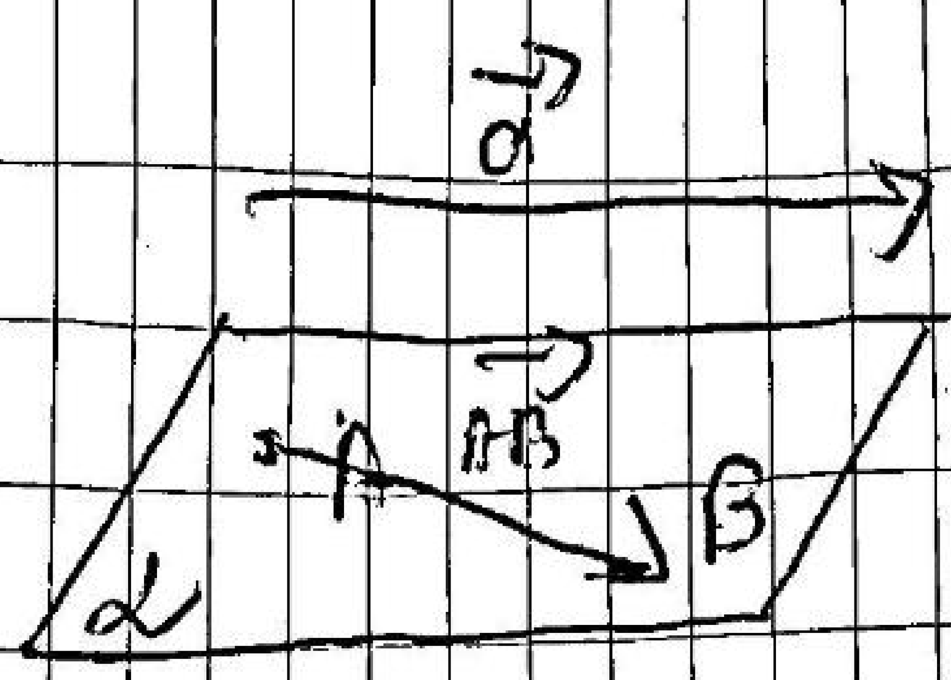
$p: \begin{cases} x=3+t \\ y=1+t \\ z=-3-t \end{cases} \qquad \begin{aligned} &3+t+1+t+3+t-4=0 \\ &3t+3=0 \\ &\underline{t=-1} \Rightarrow P(2,0,-2) \end{aligned}$

$x_1=\frac{1+x_1}{2}=2 \qquad y_1=\frac{3+y_1}{2}=0 \qquad z_1=\frac{0+z_1}{2}=-2$

$x_1=3 \qquad y_1=-3 \qquad z_1=-4$

$\boxed{A_1(3,-3,-4)}$

Зад 7. $\alpha: \begin{cases} \ni A(1,-1,2) \\ \ni B(2,1,1) \\ \parallel \vec{a}(1,2,3) \end{cases}$



$\vec{AB}(1,2,-1)$

$$\alpha: \left| \begin{array}{ccc} x-1 & y+1 & z-2 \\ 1 & 2 & 3 \\ 1 & 2 & -1 \end{array} \right| \begin{array}{cc} x-1 & y+1 \\ 1 & 2 \\ 1 & 2 \end{array} = 0$$

$$-2(x-1)+3(y+1)+\cancel{2(z-2)}-\cancel{2(z-2)}-6(x-1)+1(y+1)=$$

$$-8(x-1)+4(y+1)=0$$

$$-8x+8+4y+4=0$$

$$-8x+4y+12=0 \quad |:4$$

$$-2x+y+3=0 \quad |\cdot(-1)$$

$$\boxed{\alpha: 2x-y-3=0}$$