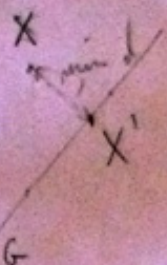


PRIMER S PRAVCOM, TOČKOM I UDALJENOSTI

IRG

$$X = [3 \ 2 \ 1]$$

$$G = \begin{bmatrix} -1 \\ 1 \\ -10 \end{bmatrix}$$



PRAVAC $-x + 4y - 10 = 0$

$$x = 4y - 10$$

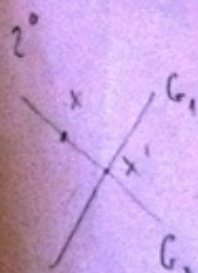
UDALJENOST $d^2 = (x-3)^2 + (y-2)^2$

ODREĐUJEMO MINIMUM

$$d^2 = (4y-13)^2 + (y-2)^2 \quad \frac{2d}{2y} = 0$$

$$8(4y-13) + 2(y-2) = 0$$

$$y' = \frac{54}{17} \quad x' = \frac{40}{17} \rightarrow d = 1.213$$



$$G_1 \perp G_2$$

$$\Rightarrow G_2 = \begin{bmatrix} 1 \\ 1 \\ c \end{bmatrix}$$

$$X \cdot G_2 = 0$$

$$\begin{bmatrix} 3 & 2 & 1 \end{bmatrix} \begin{bmatrix} 1 \\ 1 \\ c \end{bmatrix} = 0$$

$$12 + 2 + c = 0$$

$$c = -14$$

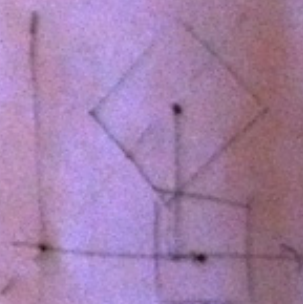
3° KAKO NAJBLIŽE?

ODREĐUJEMO SA $\sqrt{a^2 + b^2}$

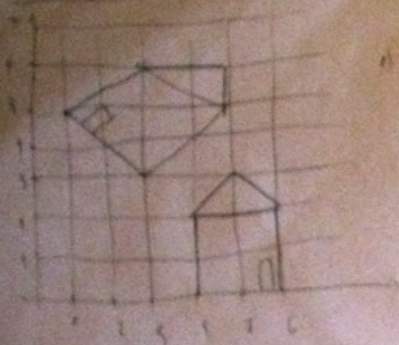
$$\rightarrow \sqrt{a^2 + b^2} = \sqrt{17}$$

$$G = \begin{bmatrix} -1 \\ 1 \\ -10 \end{bmatrix} = \begin{bmatrix} -\frac{1}{\sqrt{17}} \\ \frac{1}{\sqrt{17}} \\ -\frac{10}{\sqrt{17}} \end{bmatrix}$$

$$d = X \cdot G = \frac{-5}{\sqrt{17}} = -1.213$$



PRIMER 5 TRANSFORMACIJA



$$T = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix} \quad \text{TRANSLACIJA}$$

$$S = \begin{bmatrix} -2 & 0 & 0 \\ 0 & 2 & 0 \\ 0 & 0 & 1 \end{bmatrix} \quad \text{SKALIRANJE}$$

$$R = \begin{bmatrix} \frac{1}{\sqrt{2}} & \frac{1}{\sqrt{2}} & 0 \\ -\frac{1}{\sqrt{2}} & \frac{1}{\sqrt{2}} & 0 \\ 0 & 0 & 1 \end{bmatrix} \quad \text{ROTACIJA}$$

$$T_1 = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ -3 & 3 & 1 \end{bmatrix} \quad \text{TRANSLACIJA}$$

PROBAJMO DA
INVERTIRAJEMO MATRICU
KOJE JE POREDKOM

$$\rightarrow (T_1 \cdot T_2)^{-1} = T_2^{-1} \cdot T_1^{-1}$$

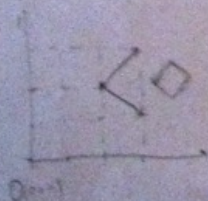
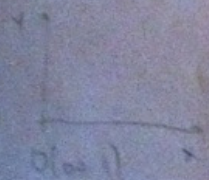
PRIMER SA KOORDINATNIM SISTAVIMA

$$O(0,0,1) \quad O_1(2,2,1)$$

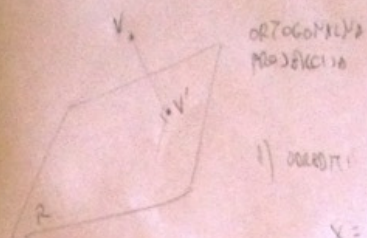
$$X = (1,0,0)^T \quad X_1 = (1,0,0)^T$$

$$Y = (0,1,0)^T \quad Y_1 = (0,1,0)^T$$

← Ovo ima valjda
primjera



PR. TOČKA I RAVNINA



$$R = [2 \ 5 \ 3 \ 1]^T$$

$$V = [1 \ 0 \ 1]^T$$

1) ODREĐITI POKUP

$$X = [t \ 1]^T \begin{bmatrix} 2 & 5 & 3 & 0 \\ 1 & 1 & 1 & 1 \end{bmatrix}$$

2) PRONAĐITE TOČKE I RAVNINE

$$V \cdot R = 0$$

ODREĐENJE TOČKE
I DOKAZ. POKUP

$$\rightarrow [(2t+1) \ (5t+1) \ (3t+1) \ 1] \begin{bmatrix} 2 \\ 5 \\ 3 \\ 1 \end{bmatrix} = 0$$

$$\Rightarrow t = -\frac{11}{38}$$

$$\Rightarrow V' = \left[-\frac{22}{38} + 1 \quad -\frac{55}{38} + 1 \quad -\frac{33}{38} + 1 \right]$$

II. PUTIN

- PRONAĐITE RAVNINE - ODREĐITE SA $\sqrt{2^2 + 5^2 + 3^2}$

$$\Rightarrow R = \left(\frac{2}{\sqrt{38}} \ \frac{5}{\sqrt{38}} \ \frac{3}{\sqrt{38}} \ \frac{1}{\sqrt{38}} \right)$$

$V \cdot R = 0$ - ODREĐITE TOČKE OD RAVNINE

RAVNINA

$$P_1 = (-3, 2, 10)$$

$$P_2 = (5, 3, 10)$$

$$\vec{M}_1 = (-3, 7, 1)$$

$$\vec{M}_2 = (5, 3, 5)$$

$$\vec{n} = \vec{M}_2 \times \vec{M}_1 = \begin{bmatrix} 2 \\ 1 \\ -15 \end{bmatrix}$$

vektor pravca

→ TOČKA IMA JEDNO I TOČKA

$$-3x_1 + 2x_2 + x_3 + 10x_4 = 0$$

$$3x_1 + 3x_2 + 5x_3 + 10x_4 = 0$$

možemo pretpostaviti da je homogeni $x_4=1$

možemo uzeti da je $x_3=0$ tj. da pravac probada Z ravninu

ako se ne dobiju rezultati onda uzeti da je $x_2=0$ ili $x_1=0$

$$\Rightarrow x_1 = \frac{2}{3} \quad x_2 = -4$$

RAVNINA POKO

$$X = \begin{bmatrix} t & 1 \\ 7 & 11 & -15 & 0 \\ \frac{2}{3} & -4 & 0 & 1 \end{bmatrix}$$

vektor pravca

TOČKA

TOČKE I PROJEKCIJA

$$V_1 = (20, 0, 20) \quad t=0$$

$$V_2 = (100, 0, 50) \quad t=1$$

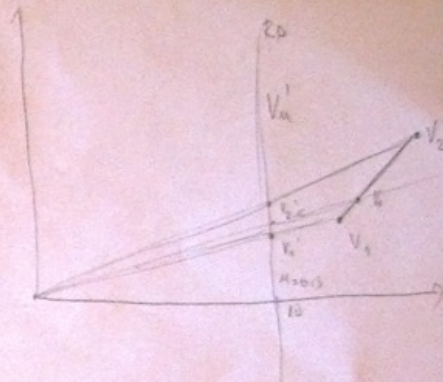
$$\mu = 0.3$$

$$C = (0, 0, 0) \text{ - centar projekcije}$$

IMPLICITNA JOKA RAVNINE PROJEKCIJE (R0)

$$z-10=0$$

$$z=10$$



TRIANGLE THE R/F

$$V_1' = \left(\frac{x_1}{z} \cdot 10, 0, z \right) = (10, 0, 20)$$

$$V_2' = \left(\frac{x_2}{z} \cdot 10, 0, z \right) = (20, 0, 50)$$

$$V_t = \begin{bmatrix} t & 1 \\ 80 & 0 & 30 & 0 \\ 20 & 0 & 20 & 1 \end{bmatrix}$$

$$V_r = \begin{bmatrix} 80t+20 & 0 & 30t+20 \\ 50t+20 & 0 & 30t+20 \end{bmatrix}$$

$$V_u = \begin{bmatrix} \mu & 1 \\ 10 & 0 & 50 & 0 \\ 10 & 0 & 20 & 1 \end{bmatrix}$$

$$\mu = 0.3 \rightarrow \begin{bmatrix} 15 & 0 & 20 \end{bmatrix}$$

SA PRAKTIČNOM KODIRANJE TOČKE NA RAVNI VU

$$\frac{80t+20}{50t+20} \cdot 10 = 13 \Rightarrow t = \frac{6}{41} = 0.146$$

$$\Rightarrow V_r = \begin{bmatrix} 13 & 0 & 20 \\ 24.39 & 0 & 24.39 \end{bmatrix}$$