

8. Za jedne ravniše simetrične sruha točku

Delit sruha (uzel sruha x , delit y, z)

$$x=0 \quad T(0,0,3)$$

$$y=0$$

$$z=3 \quad \text{od formule}$$

$$d = \frac{|Ax_0 + By_0 + Cz_0 + D|}{\sqrt{A^2 + B^2 + C^2}}$$

vzista

14.4

14.4

c)

$$\vec{n}_1 = \begin{vmatrix} 1+2x \\ x \\ -1-x \end{vmatrix}$$

$$\frac{x-3}{-1} = \frac{y-0}{2} = \frac{z+1}{-1}$$

$$\vec{n}_2 = \begin{vmatrix} 3-x \\ x+2x \\ -1-x \end{vmatrix}$$

$$1+2x = 3-u$$

$$x = u + 2u$$

$$-1-x = -1-u$$

$$-1-x = -1-u$$

$$-x = -u$$

$$x = u$$

$$1+2x = 3-u$$

$$1+2u = 3-u$$

$$u = \frac{2}{3}$$

$$x = \frac{2}{3}$$

$$x = u + 2u$$

$$\frac{2}{3} = u + 2 \cdot \frac{2}{3}$$

$$u = -\frac{2}{3}$$

14.5

$$\vec{n}_1 = \begin{vmatrix} 2-x \\ 3 \\ 2x \end{vmatrix}$$

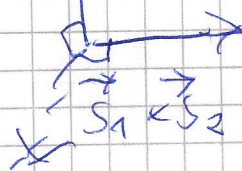
$$S_1 = \begin{vmatrix} -1 \\ 0 \\ 2 \end{vmatrix}$$

$$\vec{n}_2 = \begin{vmatrix} 1+3x \\ 3-x \\ 2 \end{vmatrix}$$

$$S_2 = \begin{vmatrix} 3 \\ -1 \\ 0 \end{vmatrix}$$

vektor skruha na dva vektora

$\vec{S}_1 \wedge \vec{S}_2$ je vektor $\vec{S}_1 \times \vec{S}_2$



$$\vec{s}_1 \times \vec{s}_2 = \begin{vmatrix} \vec{i} & \vec{j} & \vec{k} & \vec{i} & \vec{j} \\ -1 & 0 & 2 & 4 & 0 \\ 3 & -1 & 0 & 3 & -1 \end{vmatrix}$$

$$= 0\vec{i} + 6\vec{j} + 1\vec{k} - (0\vec{i} + 2\vec{j} + 0\vec{k})$$

$$\vec{s} = 2\vec{i} + 6\vec{j} + 1\vec{k}$$

$$\vec{s} = \begin{bmatrix} 2 \\ 6 \\ 1 \end{bmatrix}, T(1, 3, 2)$$

$$\frac{x-1}{2} = \frac{y-3}{6} = \frac{z-2}{1}$$

14.6

$$A(1, 0, 2)$$

$$B(0, 2, 1)$$

$$C(-2, 4, 1)$$

$$\vec{r} = \vec{r}_A + U\vec{s}_1 + V\vec{s}_2$$

$$\vec{r} = \begin{bmatrix} 1 \\ 0 \\ 2 \end{bmatrix} + U \cdot \begin{bmatrix} -1 \\ 3 \\ -1 \end{bmatrix} + V \cdot \begin{bmatrix} -2 \\ 4 \\ 0 \end{bmatrix}$$

$$\vec{s}_1 = \vec{AB} = \begin{bmatrix} -1 \\ 3 \\ -1 \end{bmatrix}$$

$$\vec{s}_2 = \vec{BC} = \begin{bmatrix} -2 \\ 4 \\ 0 \end{bmatrix}$$

no common vector direction
 hence su parallel
 (are not)

$$\vec{r} = \begin{bmatrix} 1-U-2V \\ -3U+4V \\ 2-U \end{bmatrix}$$

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

$$A(0, 0, 2)$$

$$B(0, -1, 0)$$

$$C\left(\frac{2}{3}, 0, 0\right) \dots \text{ista linija sadrži vektor}$$

Smisli 2 točke u
prostoru 3.

e)

$$A(0, 2, 2)$$

$$\vec{n}_1 = \begin{matrix} s_1 \\ 2 = U \\ s_1 + v \\ -2U + 3v \end{matrix}$$

$$\vec{n}_2 = \begin{bmatrix} 0 \\ -2 \\ 2 \end{bmatrix} + U \cdot \begin{bmatrix} -1 \\ 0 \\ 2 \end{bmatrix} + v \cdot \begin{bmatrix} 0 \\ 1 \\ 3 \end{bmatrix}$$

$$= \begin{bmatrix} -U \\ -2 + v \\ 2 - 2U + 3v \end{bmatrix}$$

paralelne ravni
imaju iste ili
proporcionalne vekt.
smjera \vec{s}_1 i \vec{s}_2

$$\vec{s}_1 = \begin{bmatrix} -1 \\ 0 \\ -2 \end{bmatrix}$$

$$\vec{s}_2 = \begin{bmatrix} 0 \\ 1 \\ 3 \end{bmatrix}$$



14.7

a)

$$A(x_0, y_0, z_0) \\ A(3, -1, 0)$$

$$B(-1, 0, 2)$$

$$C(2, 1, -1)$$

$$\vec{s}_1 = \vec{AB} = \begin{bmatrix} -4 \\ 1 \\ 2 \end{bmatrix}$$

$$\vec{s}_2 = \vec{CA} = \begin{bmatrix} 1 \\ -2 \\ 1 \end{bmatrix}$$

$$\vec{n} = \vec{s}_1 \times \vec{s}_2 = \begin{vmatrix} \vec{i} & \vec{j} & \vec{k} \\ -4 & 1 & 2 \\ 1 & -2 & 1 \end{vmatrix} = \begin{bmatrix} 5 \\ 6 \\ 7 \end{bmatrix}$$

$$A \cdot (x - x_0) + B \cdot (y - y_0) + C \cdot (z - z_0)$$

$$5 \cdot (x - 3) + 6 \cdot (y + 1) + 7 \cdot (z - 0)$$

$$5x - 15 + 6y + 6 + 7z = 0$$

$$5x + 6y + 7z - 9 = 0$$

2)

$$\vec{n} = \begin{bmatrix} 1-v \\ 2+u+v \\ 3 \end{bmatrix}$$

$$T(1, 2, 3)$$

$$\vec{s}_1 = \begin{bmatrix} 0 \\ 1 \\ 0 \end{bmatrix}$$

$$\vec{s}_2 = \begin{bmatrix} -1 \\ 1 \\ 0 \end{bmatrix}$$

$$\vec{s}_1 \times \vec{s}_2 = \begin{bmatrix} 1 & 1 & 0 \\ 0 & 1 & 0 \\ -1 & 1 & 0 \end{bmatrix} \begin{bmatrix} 1 \\ 1 \\ -1 \end{bmatrix}$$

istea este
produsul
vectorial.

14.8

$$2x - y + z = 0 \quad \text{și} \quad x + 2y - z + 2 = 0$$

Gauss

$$\begin{bmatrix} 2 & -1 & 1 & ; & 0 \\ 1 & 2 & -1 & ; & -2 \end{bmatrix} \leftarrow \begin{matrix} \text{schimb} \\ \cdot (-2) \end{matrix}$$

iff je delecte: $\begin{bmatrix} 1 & 0 & \dots \\ 0 & 1 & \dots \end{bmatrix}$

iff $\begin{bmatrix} 0 & 1 & \dots \\ 1 & 0 & \dots \end{bmatrix}$

$$\begin{bmatrix} 0 & -5 & 3 & ; & 4 \\ 1 & 2 & -1 & ; & -2 \end{bmatrix} \leftarrow \begin{matrix} \cdot (-5) \\ \cdot (-2) \end{matrix}$$

$$\begin{bmatrix} 0 & 1 & -\frac{3}{5} & ; & -\frac{4}{5} \\ 1 & 2 & -1 & ; & -2 \end{bmatrix} \leftarrow \begin{matrix} \cdot (-2) \\ \cdot (-2) \end{matrix}$$

$$\begin{bmatrix} 0 & 1 & -\frac{3}{5} & ; & -\frac{4}{5} \\ 1 & 0 & \frac{1}{5} & ; & -\frac{2}{5} \end{bmatrix}$$

$$y - \frac{3}{5}z = -\frac{4}{5}$$

$$x + \frac{1}{5}z = -\frac{2}{5}$$

$$x = -\frac{2}{5} - \frac{1}{5}z$$

$$y = -\frac{4}{5} + \frac{3}{5}z$$

$$z = t$$

vectorial delecte:

$$\vec{n} = \begin{bmatrix} 1 & 1 & 0 \\ 0 & 1 & 0 \\ -1 & 1 & 0 \end{bmatrix} \begin{bmatrix} 1 \\ 1 \\ -1 \end{bmatrix}$$

$$\vec{n} = \begin{bmatrix} 2 & -\frac{1}{5}t \\ 0 & \frac{1}{5}t \\ -4 & \frac{3}{5}t \\ t \end{bmatrix}$$

parametric delecte:

$$\frac{x + \frac{2}{5}}{-\frac{1}{5}} = \frac{y + \frac{4}{5}}{\frac{3}{5}} = \frac{z}{1}$$

b) \vec{n}_1 i \vec{n}_2 zapisati u vjecn
 obliku (kao u 7.a) i 7.b)
 i onda dalje isto kao 8.a)

14.9.

a) $x - 2y - z + 2 = 0$

$\frac{x-2}{-3} = \frac{y+1}{2} = \frac{z}{-1}$

$\vec{n} = \begin{bmatrix} 1 \\ -2 \\ -1 \end{bmatrix}$ $\vec{s} = \begin{bmatrix} 3 \\ 2 \\ -1 \end{bmatrix}$

*međusobno
mnozake*

\vec{s} i \vec{n} paralelni? nisu
 \vec{s} i \vec{n} sekudni? nisu

~~zadni je pravci~~
 znaci da pravci i
 ravnina nisu okomit
 (dake imajete je skruker)

\vec{s} i \vec{n} okomiti?
 $\vec{s} \cdot \vec{n} = 0$?

$1 \cdot 3 - 2 \cdot 2 - 1 \cdot (-1) = 0$

pravci i ravnina su paralelni

b) $\vec{s} = \begin{bmatrix} -2 \\ 2 \\ -1 \end{bmatrix}$ $\vec{n} = \begin{bmatrix} 2 \\ 1 \\ 1 \end{bmatrix}$ (pravci normalni ($\vec{n} = \vec{s}_1 \times \vec{s}_2$))
 i onda dalje isto kao 9.a)

11.40

$$\vec{n}_1 = \begin{bmatrix} 1-u \\ 2+u+2v \\ 3-v \end{bmatrix}$$

$$\vec{n}_2 = \begin{bmatrix} 1+2x \\ 0 \\ -1+x \end{bmatrix}$$

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

$$\vec{n} = \begin{bmatrix} 2-x \\ x \\ 3-y \end{bmatrix}$$

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

$$4 - 2x - x + 3 + 2 = 0$$

$$-3x = -9 \quad | :(-3)$$

$$\boxed{x=3}$$

nasstina A u \vec{n}

$$2 - 3 = -1$$

③

①

$$T(-1, 3, 1)$$

2) ravninu u općem obliku
pravce u vektorski
i dalje istu kao u)

11.41

$$\vec{n}_1 = \begin{bmatrix} 1-u \\ 2+u+x \\ 3-v \end{bmatrix}$$

$$\vec{n}_2 = \begin{bmatrix} 1-x \\ 0 \\ -1+x \end{bmatrix}$$

$$\vec{s}_1 = \begin{bmatrix} -1 \\ 1 \\ 0 \end{bmatrix}, \quad \vec{s}_2 = \begin{bmatrix} 0 \\ 2 \\ -1 \end{bmatrix}$$

$$\vec{n} = \vec{s}_1 \times \vec{s}_2 = \dots$$

$$\vec{n} = \begin{bmatrix} -1 \\ -1 \\ -2 \end{bmatrix} \quad A(1, 2, 3)$$

$$A(x-x_0) + B(y-y_0) + C(z-z_0)$$