Seminari 4

Matematičke metode za informatičare

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FOI, Varaždin

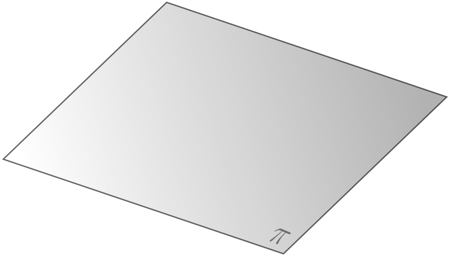
Sadržaj

prvi zadatak

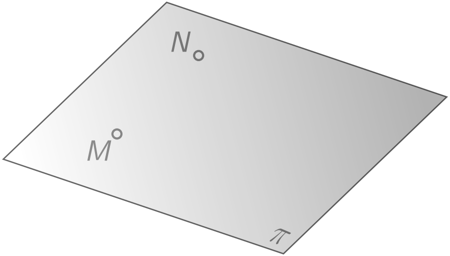
Zadatak 1

Odredite jednadžbu ravnine π *koja prolazi točkama* $M(3,4,-1)$, $N(-2,-3,-2)$ *i paralelna je s* y*-osi. Odredite točke u kojima ravnina* π *siječe preostale koordinatne osi.*

Rješenje

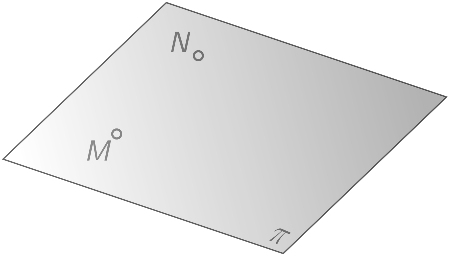


Rješenje



Rješenje

$M(3,4,-1), \quad N(-2,-3,-2)$



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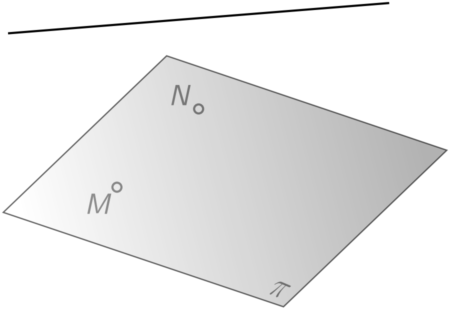

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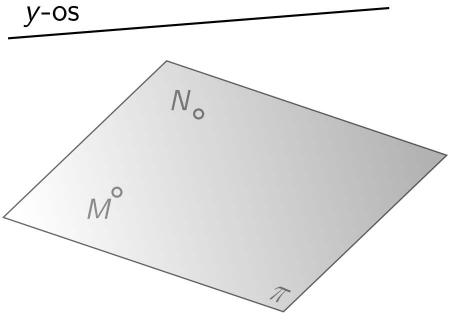
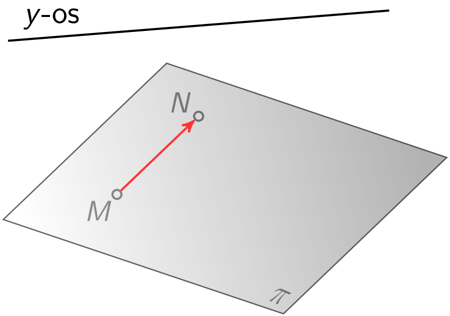
$M(3,4,-1), \quad N(-2,-3,-2)$



Rješenje

$M(3, 4, -1), \quad N(-2, -3, -2)$



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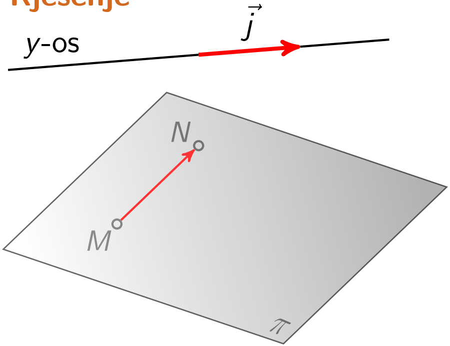
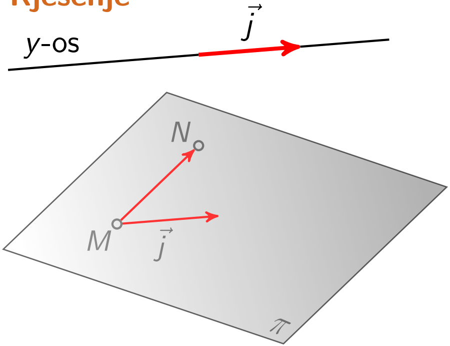
$M(3,4,-1), \quad N(-2,-3,-2)$



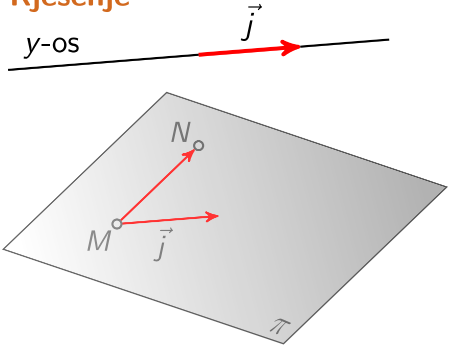
Rješenje



$M(3, 4, -1), \quad N(-2, -3, -2)$

Rješenje

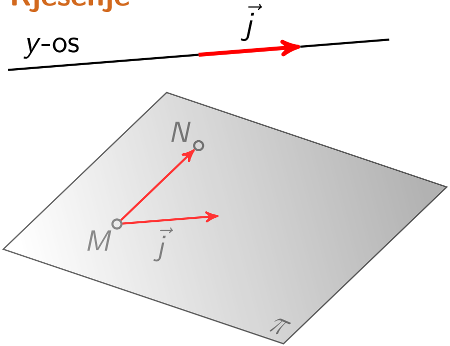
$M(3,4,-1),\ \ N(-2,-3,-2)$



Parametarske jednadžbe

Rješenje

$M(3,4,-1),\quad N(-2,-3,-2)$

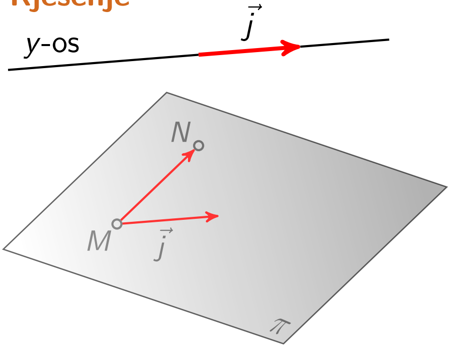


Parametarske jednadžbe

$\pi \ldots$

Rješenje

$M(3, 4, -1), \;\; N(-2, -3, -2)$

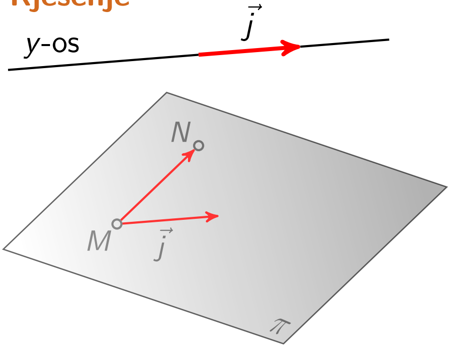


Parametarske jednadžbe

$\pi \ldots \; M,$

Rješenje

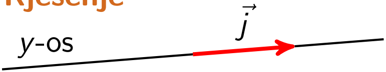
$M(3,4,-1),\ \ N(-2,-3,-2)$



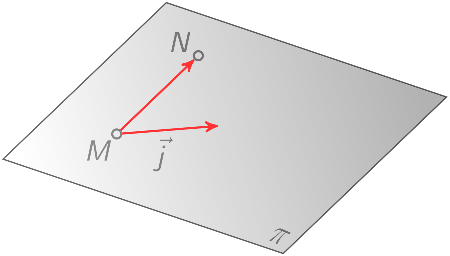
Parametarske jednadžbe

$\pi \ldots\ M,\ \overrightarrow{MN},$

Rješenje



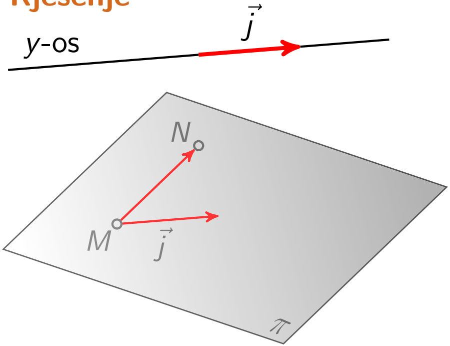
$M(3,4,-1),\ \ N(-2,-3,-2)$



Parametarske jednadžbe

$\pi \ldots\ M,\ \overrightarrow{MN},\ \vec{j}$

Rješenje



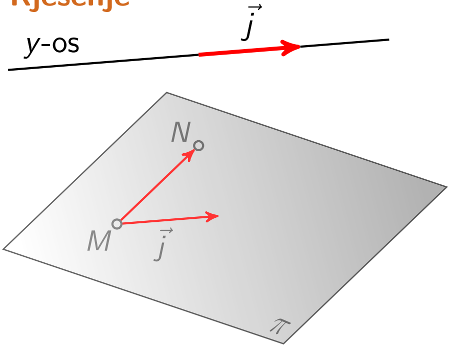
$M(3,4,-1), \;\; N(-2,-3,-2)$

$\overrightarrow{MN} =$

Parametarske jednadžbe

$\pi \ldots \; M, \; \overrightarrow{MN}, \; \vec{j}$

Rješenje



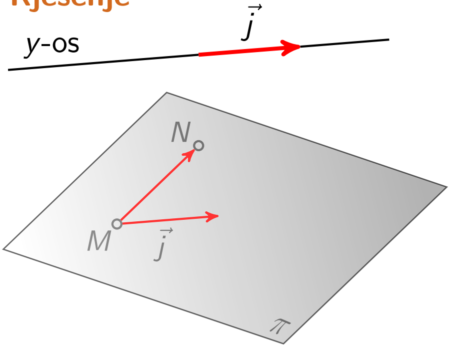
$M(3, 4, -1), \ \ N(-2, -3, -2)$

$\overrightarrow{MN} = (-5, -7, -1)$

Parametarske jednadžbe

$\pi \ldots \ M, \ \overrightarrow{MN}, \ \vec{j}$

Rješenje



$M(3,4,-1), \quad N(-2,-3,-2)$

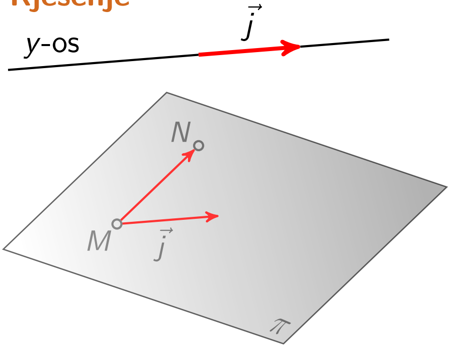
$\overrightarrow{MN} = (-5,-7,-1)$

$\vec{j} =$

Parametarske jednadžbe

$\pi \ldots \; M, \; \overrightarrow{MN}, \; \vec{j}$

Rješenje



$M(3,4,-1), \quad N(-2,-3,-2)$

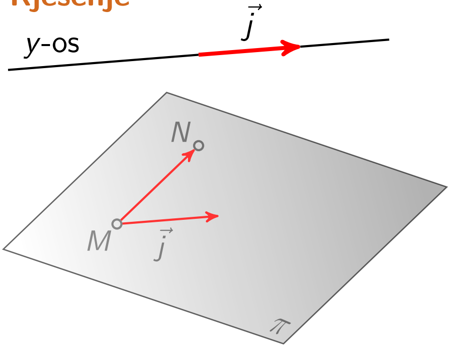
$\overrightarrow{MN} = (-5,-7,-1)$

$\vec{j} = (0,1,0)$

Parametarske jednadžbe

$\pi \ldots \; M, \; \overrightarrow{MN}, \; \vec{j}$

Rješenje



$M(3, 4, -1), \quad N(-2, -3, -2)$

$\overrightarrow{MN} = (-5, -7, -1)$

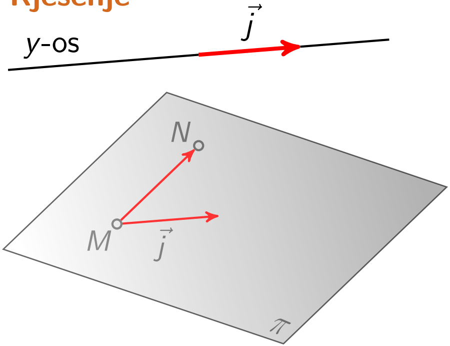
$\vec{j} = (0, 1, 0)$

Parametarske jednadžbe

$\pi \ldots \ M, \ \overrightarrow{MN}, \ \vec{j}$

$$\pi \ldots \left\{ \begin{array}{l} \\ \\ \end{array} \right.$$

Rješenje



$$M(3,4,-1), \quad N(-2,-3,-2)$$

$$\overrightarrow{MN} = (-5,-7,-1)$$

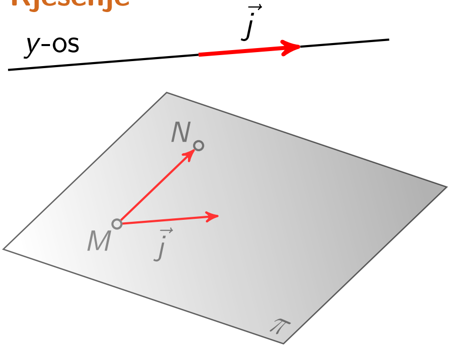
$$\vec{j} = (0,1,0)$$

Parametarske jednadžbe

$$\pi \ldots\ M,\ \overrightarrow{MN},\ \vec{j}$$

$$\pi \ldots \begin{cases} x = \\ y = \\ z = \end{cases}$$

Rješenje



$M(3,4,-1), \quad N(-2,-3,-2)$

$\overrightarrow{MN} = (-5,-7,-1)$

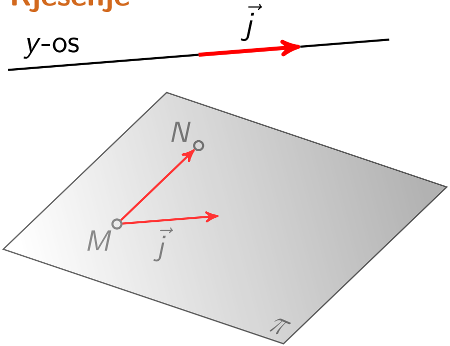
$\vec{j} = (0,1,0)$

Parametarske jednadžbe

$\pi \ldots M, \overrightarrow{MN}, \vec{j}$

$$\pi \ldots \begin{cases} x = 3 \\ y = 4 \\ z = -1 \end{cases}$$

Rješenje



$M(3,4,-1), \quad N(-2,-3,-2)$

$\overrightarrow{MN} = (-5,-7,-1)$

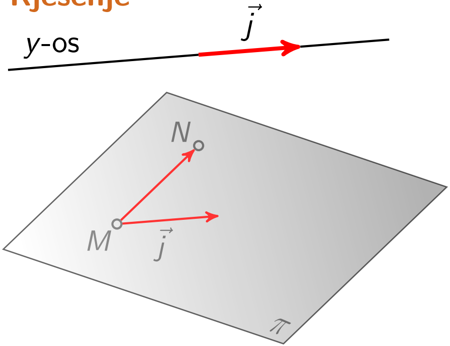
$\vec{j} = (0,1,0)$

Parametarske jednadžbe

$\pi \ldots \; M, \; \overrightarrow{MN}, \; \vec{j}$

$$\pi \ldots \begin{cases} x = 3 + \\ y = 4 + \\ z = -1 + \end{cases}$$

Rješenje



$M(3,4,-1),\quad N(-2,-3,-2)$

$\overrightarrow{MN} = (-5,-7,-1)$

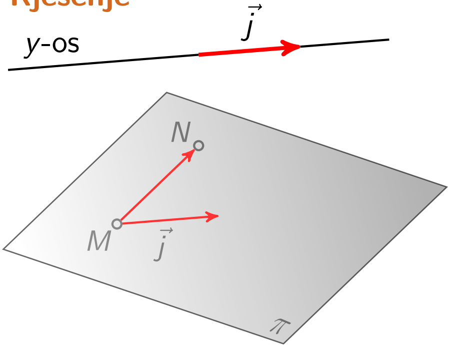
$\vec{j} = (0,1,0)$

Parametarske jednadžbe

$\pi \ldots\ M,\ \overrightarrow{MN},\ \vec{j}$

$$\pi \ldots \begin{cases} x = 3 + (-5) \\ y = 4 + (-7) \\ z = -1 + (-1) \end{cases}$$

Rješenje



$M(3, 4, -1), \quad N(-2, -3, -2)$

$\overrightarrow{MN} = (-5, -7, -1)$

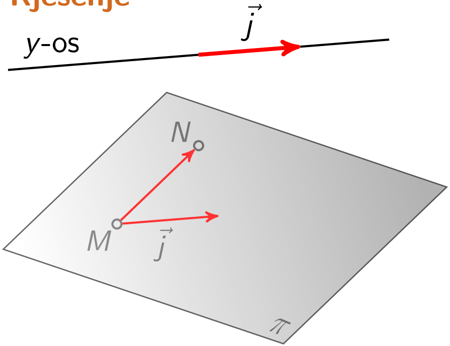
$\vec{j} = (0, 1, 0)$

Parametarske jednadžbe

$\pi \ldots \; M, \; \overrightarrow{MN}, \; \vec{j}$

$$\pi \ldots \begin{cases} x = 3 + (-5) \cdot u \\ y = 4 + (-7) \cdot u \\ z = -1 + (-1) \cdot u \end{cases}$$

Rješenje



$M(3,4,-1), \quad N(-2,-3,-2)$

$\overrightarrow{MN} = (-5,-7,-1)$

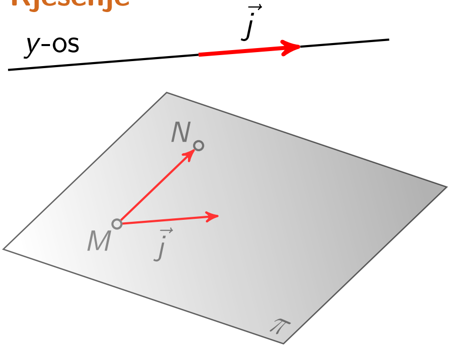
$\vec{j} = (0,1,0)$

Parametarske jednadžbe

$\pi \ldots \ M, \ \overrightarrow{MN}, \ \vec{j}$

$$\pi \ldots \begin{cases} x = 3 + (-5) \cdot u + \\ y = 4 + (-7) \cdot u + \\ z = -1 + (-1) \cdot u + \end{cases}$$

Rješenje



$M(3,4,-1),\quad N(-2,-3,-2)$

$\overrightarrow{MN} = (-5,-7,-1)$

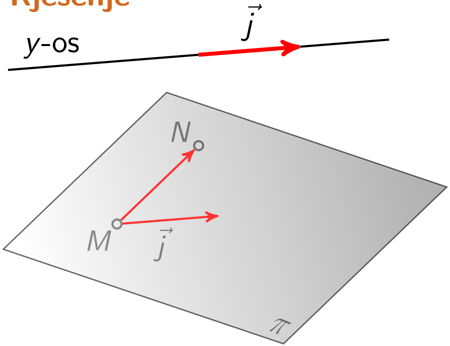
$\vec{j} = (0,1,0)$

Parametarske jednadžbe

$\pi \ldots M,\ \overrightarrow{MN},\ \vec{j}$

$$\pi \ldots \begin{cases} x = 3 + (-5)\cdot u + 0 \\ y = 4 + (-7)\cdot u + 1 \\ z = -1 + (-1)\cdot u + 0 \end{cases}$$

Rješenje



$M(3, 4, -1), \quad N(-2, -3, -2)$

$\overrightarrow{MN} = (-5, -7, -1)$

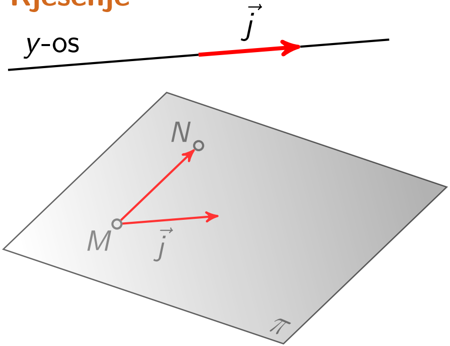
$\vec{j} = (0, 1, 0)$

Parametarske jednadžbe

$\pi \ldots \; M, \; \overrightarrow{MN}, \; \vec{j}$

$$\pi \ldots \begin{cases} x = 3 + (-5) \cdot u + 0 \cdot v \\ y = 4 + (-7) \cdot u + 1 \cdot v \\ z = -1 + (-1) \cdot u + 0 \cdot v \end{cases}$$

Rješenje



$M(3,4,-1),\quad N(-2,-3,-2)$

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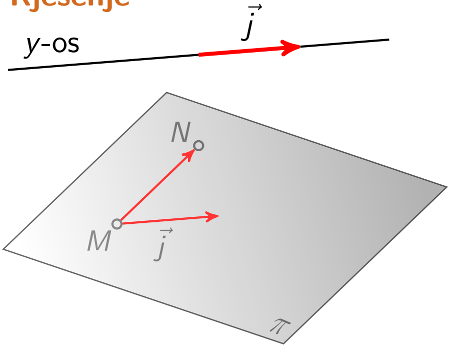
Parametarske jednadžbe

$\pi \ldots\ M,\ \overrightarrow{MN},\ \vec{j}$

$$\pi \ldots \begin{cases} x = 3 + (-5)\cdot u + 0\cdot v \\ y = 4 + (-7)\cdot u + 1\cdot v \\ z = -1 + (-1)\cdot u + 0\cdot v \end{cases}$$

$$\pi \ldots \Bigg\{$$

Rješenje



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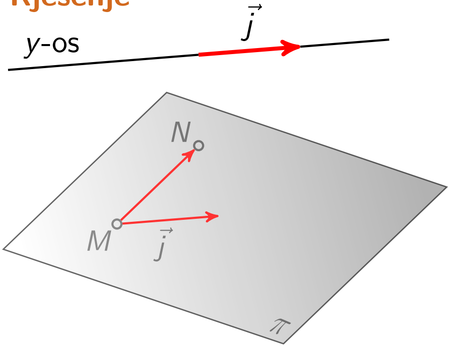
Parametarske jednadžbe

$\pi \ldots M, \overrightarrow{MN}, \vec{j}$

$$\pi \ldots \begin{cases} x = 3 + (-5)\cdot u + 0\cdot v \\ y = 4 + (-7)\cdot u + 1\cdot v \\ z = -1 + (-1)\cdot u + 0\cdot v \end{cases}$$

$$\pi \ldots \begin{cases} x = 3 - 5u \\ \\ \\ \end{cases}$$

Rješenje



$M(3, 4, -1),\quad N(-2, -3, -2)$

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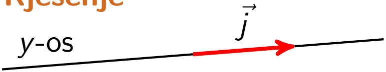
Parametarske jednadžbe

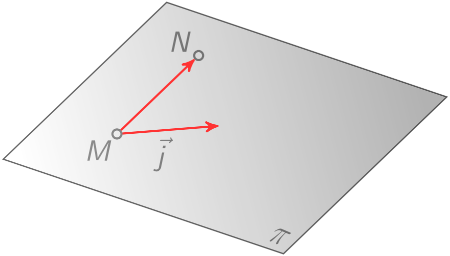
$\pi \ldots\ M,\ \overrightarrow{MN},\ \vec{j}$

$$\pi \ldots \begin{cases} x = 3 + (-5) \cdot u + 0 \cdot v \\ y = 4 + (-7) \cdot u + 1 \cdot v \\ z = -1 + (-1) \cdot u + 0 \cdot v \end{cases}$$

$$\pi \ldots \begin{cases} x = 3 - 5u \\ y = 4 - 7u + v \\ \end{cases}$$

Rješenje





$M(3,4,-1), \quad N(-2,-3,-2)$

$\overrightarrow{MN} = (-5,-7,-1)$

$\vec{j} = (0,1,0)$

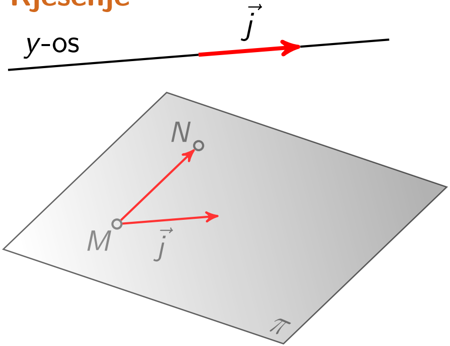
Parametarske jednadžbe

$\pi \ldots \; M, \; \overrightarrow{MN}, \; \vec{j}$

$$\pi \ldots \begin{cases} x = 3 + (-5)\cdot u + 0 \cdot v \\ y = 4 + (-7)\cdot u + 1 \cdot v \\ z = -1 + (-1)\cdot u + 0 \cdot v \end{cases}$$

$$\pi \ldots \begin{cases} x = 3 - 5u \\ y = 4 - 7u + v \\ z = -1 - u \end{cases}$$

Rješenje



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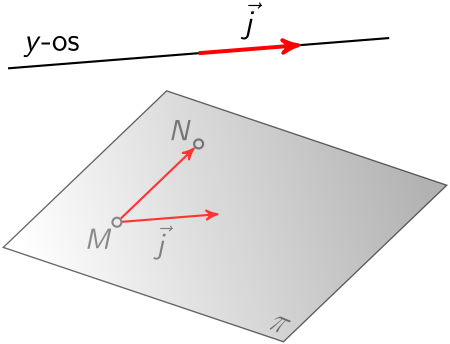
$$\vec{j} = (0,1,0)$$

Parametarske jednadžbe

$$\pi \ldots\ M,\ \overrightarrow{MN},\ \vec{j}$$

$$\pi \ldots \begin{cases} x = 3 + (-5)\cdot u + 0\cdot v \\ y = 4 + (-7)\cdot u + 1\cdot v \\ z = -1 + (-1)\cdot u + 0\cdot v \end{cases}$$

$$\pi \ldots \begin{cases} x = 3 - 5u \\ y = 4 - 7u + v \\ z = -1 - u \end{cases} \qquad u, v \in \mathbb{R}$$

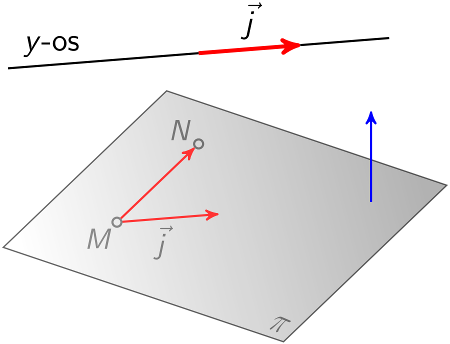


$M(3,4,-1), \;\; N(-2,-3,-2)$

$\overrightarrow{MN} = (-5,-7,-1)$

$\vec{j} = (0,1,0)$

Opći oblik



$M(3,4,-1), \quad N(-2,-3,-2)$

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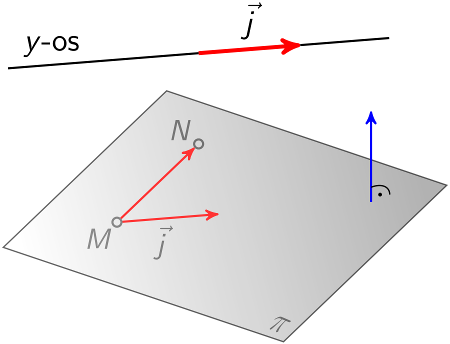
$\vec{j} = (0,1,0)$

Opći oblik

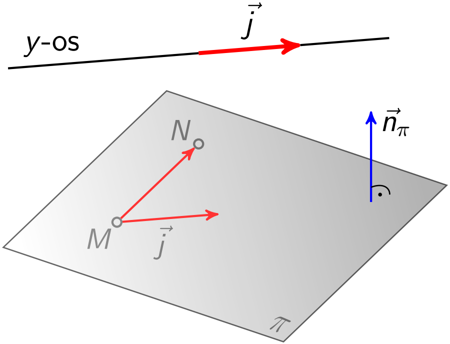


$M(3, 4, -1)$, $N(-2, -3, -2)$

$\overrightarrow{MN} = (-5, -7, -1)$

$\vec{j} = (0, 1, 0)$

Opći oblik



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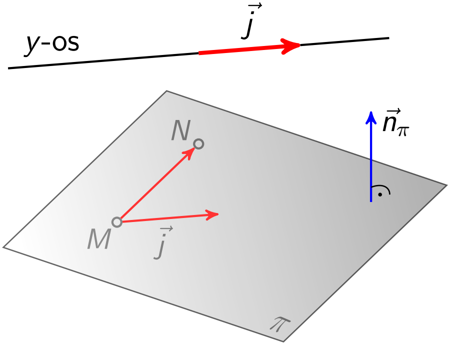
Opći oblik



$M(3,4,-1), \quad N(-2,-3,-2)$

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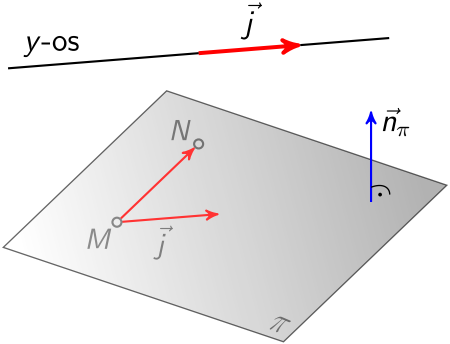
Opći oblik

$\pi \ldots$



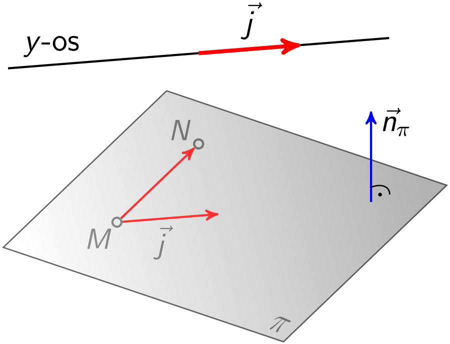
$M(3,4,-1), \quad N(-2,-3,-2)$

$\overrightarrow{MN} = (-5,-7,-1)$

$\vec{j} = (0,1,0)$

Opći oblik

$\pi \ldots M,$



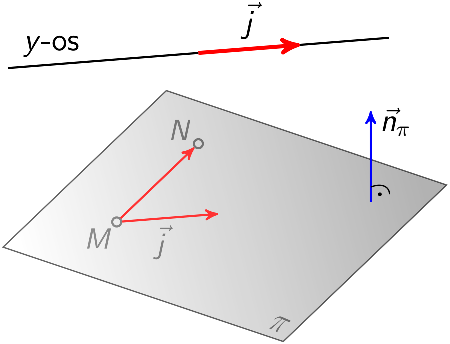
$M(3, 4, -1), \quad N(-2, -3, -2)$

$\overrightarrow{MN} = (-5, -7, -1)$

$\vec{j} = (0, 1, 0)$

Opći oblik

$\pi \ldots \; M, \; \vec{n}_\pi$



$$M(3,4,-1), \quad N(-2,-3,-2)$$

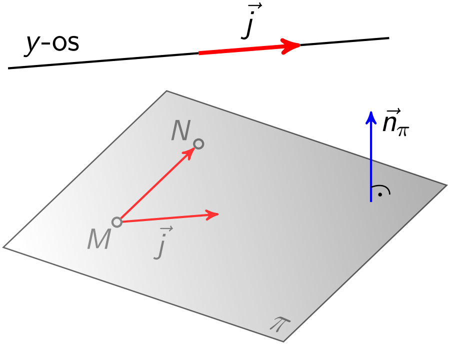
$$\overrightarrow{MN} = (-5,-7,-1)$$

$$\vec{j} = (0,1,0)$$

Opći oblik

$\pi \ldots M,\ \vec{n}_\pi$

$$\vec{n}_\pi = \vec{j} \times \overrightarrow{MN}$$



$M(3,4,-1), \quad N(-2,-3,-2)$

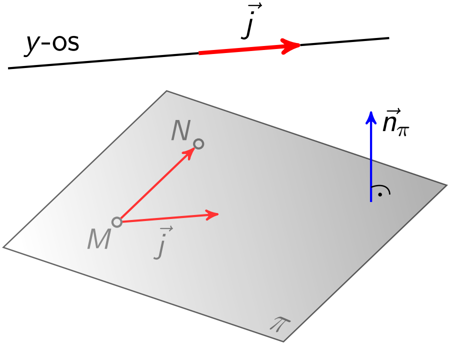
$\overrightarrow{MN} = (-5,-7,-1)$

$\vec{j} = (0,1,0)$

Opći oblik

$\pi \ldots M, \ \vec{n}_\pi$

$$\vec{n}_\pi = \vec{j} \times \overrightarrow{MN} = \left| \phantom{\begin{matrix} a & b & c \\ d & e & f \\ g & h & i \end{matrix}} \right|$$



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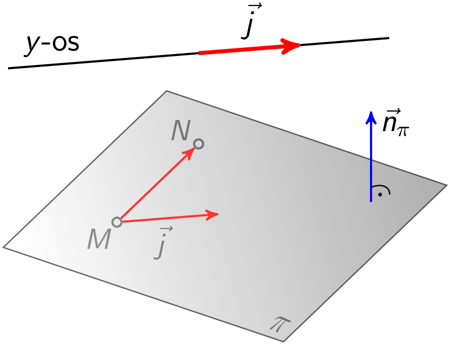
Opći oblik

$\pi \ldots M, \ \vec{n}_\pi$

$$\vec{n}_\pi = \vec{j} \times \overrightarrow{MN} = \begin{vmatrix} \vec{i} & \vec{j} & \vec{k} \\ & & \\ & & \end{vmatrix}$$



$M(3,4,-1),\ \ N(-2,-3,-2)$

$\overrightarrow{MN} = (-5,-7,-1)$

$\vec{j} = (0,1,0)$

Opći oblik

$\pi \ldots M,\ \vec{n}_\pi$

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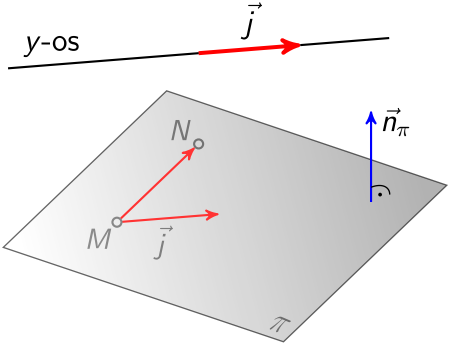

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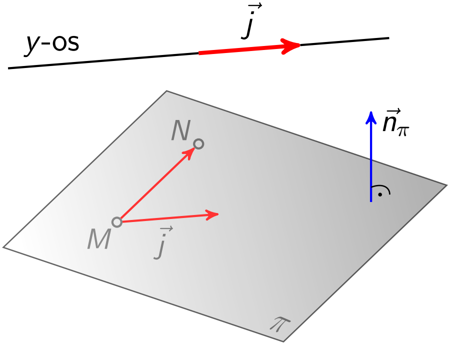

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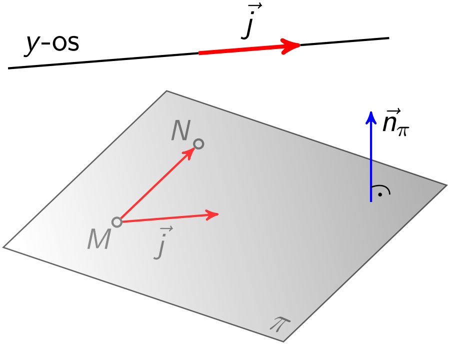

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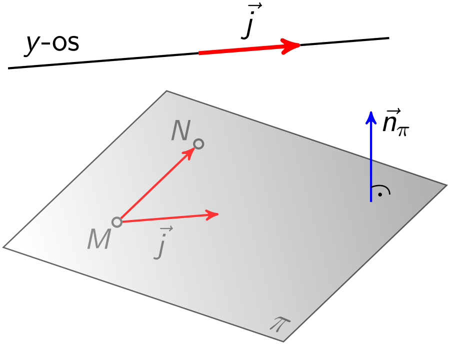

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Opći oblik

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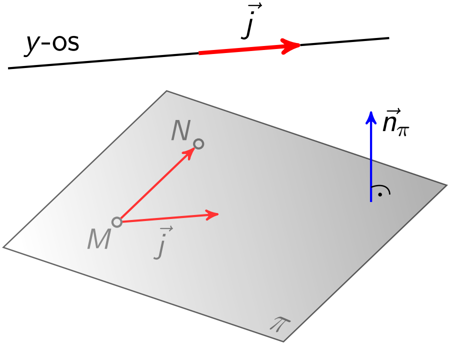

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Opći oblik

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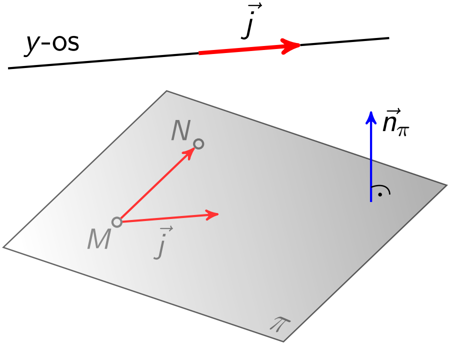

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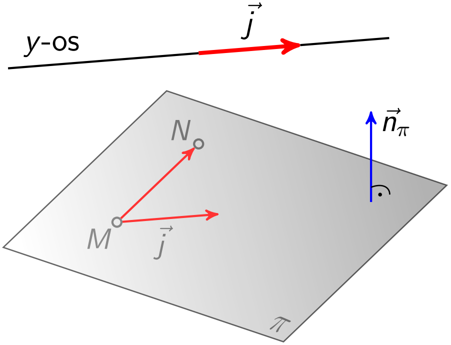
$$A(x-x_0) + B(y-y_0) + C(z-z_0) = 0$$



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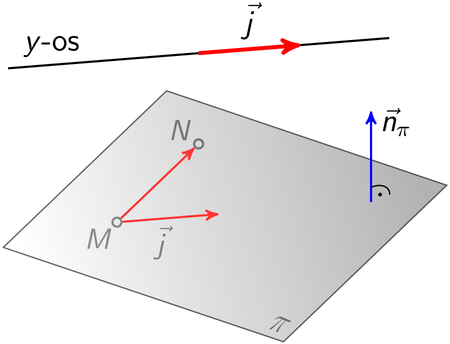
$$A(x-x_0) + B(y-y_0) + C(z-z_0) = 0$$



$$M(3,4,-1),\quad N(-2,-3,-2)$$

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$$\vec{j} = (0,1,0)$$

Opći oblik

$$\overset{x_0}{}\ \overset{y_0}{}\ \overset{z_0}{}$$
$$M(3,4,-1)$$

$$\pi \ldots M,\ \vec{n}_\pi$$

$$\vec{n}_\pi = \vec{j} \times \overrightarrow{MN} = \begin{vmatrix} \vec{i} & \vec{j} & \vec{k} \\ 0 & 1 & 0 \\ -5 & -7 & -1 \end{vmatrix} = \overset{A\ \ B\ C}{(-1,0,5)}$$

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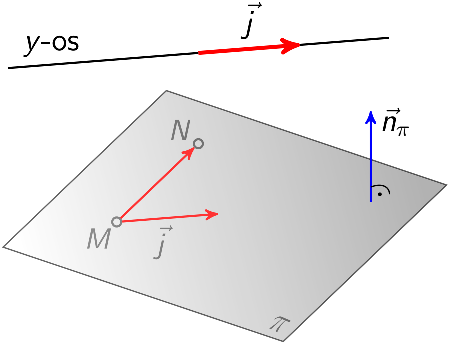


Opći oblik

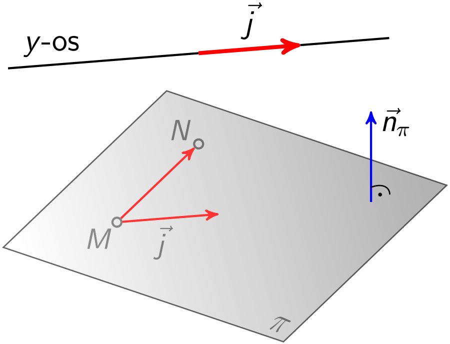
$$\begin{array}{c} \color{blue}{x_0 \quad y_0 \quad z_0} \\ M(3,4,-1) \end{array}$$

$\pi \ldots M, \vec{n}_\pi$

$$\vec{n}_\pi = \vec{j} \times \overrightarrow{MN} = \begin{vmatrix} \vec{i} & \vec{j} & \vec{k} \\ 0 & 1 & 0 \\ -5 & -7 & -1 \end{vmatrix} = \begin{array}{c} \color{blue}{A \quad B \quad C} \\ (-1,0,5) \end{array}$$

$$A(x-x_0) + B(y-y_0) + C(z-z_0) = 0$$

$-1 \cdot$



$M(3,4,-1),\quad N(-2,-3,-2)$

$\overrightarrow{MN} = (-5,-7,-1)$

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Općí oblik

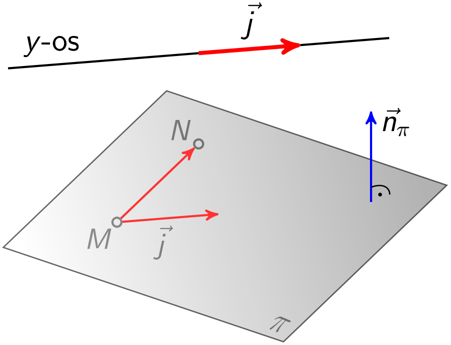
$\begin{array}{c} \color{blue}{x_0\ \ y_0\ \ z_0} \\ M(3,4,-1) \end{array}$

$\pi \ldots M,\ \vec{n}_\pi$

$$\vec{n}_\pi = \vec{j} \times \overrightarrow{MN} = \begin{vmatrix} \vec{i} & \vec{j} & \vec{k} \\ 0 & 1 & 0 \\ -5 & -7 & -1 \end{vmatrix} = \begin{array}{c} \color{blue}{A\ \ \ B\ \ C} \\ (-1,0,5) \end{array}$$

$$A(x-x_0) + B(y-y_0) + C(z-z_0) = 0$$

$-1 \cdot (x -$



$M(3,4,-1),\quad N(-2,-3,-2)$

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$\vec{j} = (0,1,0)$

Opći oblik

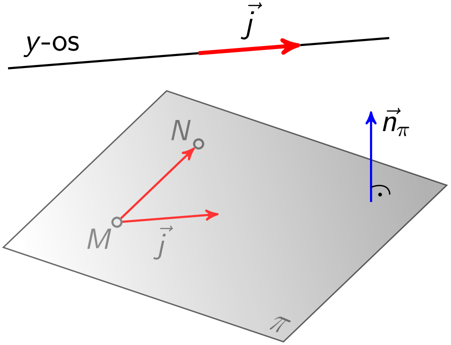
$$\overset{x_0\ y_0\ z_0}{M(3,4,-1)}$$

$\pi \ldots M,\ \vec{n}_\pi$

$$\vec{n}_\pi = \vec{j} \times \overrightarrow{MN} = \begin{vmatrix} \vec{i} & \vec{j} & \vec{k} \\ 0 & 1 & 0 \\ -5 & -7 & -1 \end{vmatrix} = \overset{A\quad B\quad C}{(-1,0,5)}$$

$$A(x-x_0) + B(y-y_0) + C(z-z_0) = 0$$

$$-1 \cdot (x-3)$$



$$M(3,4,-1), \quad N(-2,-3,-2)$$

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Opći oblik

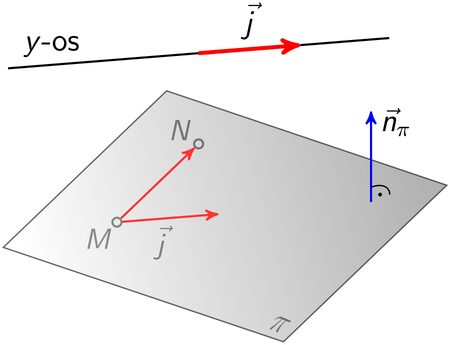
$$\begin{array}{c} \color{blue}{x_0 \;\; y_0 \;\; z_0} \\ M(3,4,-1) \end{array}$$

$$\pi \ldots M,\ \vec{n}_\pi$$

$$\vec{n}_\pi = \vec{j} \times \overrightarrow{MN} = \begin{vmatrix} \vec{i} & \vec{j} & \vec{k} \\ 0 & 1 & 0 \\ -5 & -7 & -1 \end{vmatrix} = \begin{array}{c} \color{blue}{A \;\; B \;\; C} \\ (-1,0,5) \end{array}$$

$$A(x-x_0) + B(y-y_0) + C(z-z_0) = 0$$

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



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Opći oblik

$$\begin{array}{c} \;\;x_0\;\; y_0\;\;\; z_0 \\ M(3,\,4,\,-1) \end{array}$$

$$\pi \ldots M,\ \vec{n}_\pi$$

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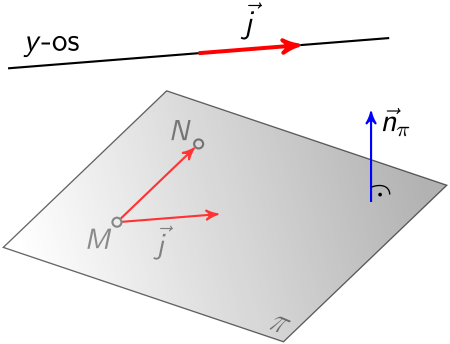
$$A(x-x_0)+B(y-y_0)+C(z-z_0)=0$$

$$-1\cdot(x-3)+0\cdot(y-$$



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Opći oblik

$$\begin{array}{c} x_0 \; y_0 \;\; z_0 \\ M(3,4,-1) \end{array}$$

$\pi \ldots M, \, \vec{n}_\pi$

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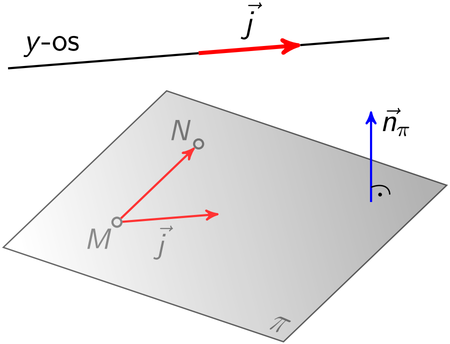
$$-1 \cdot (x-3) + 0 \cdot (y-4)$$



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Općí oblik

$$\begin{array}{c} \;\;x_0\;\; y_0\;\; z_0 \\ M(3,4,-1) \end{array}$$

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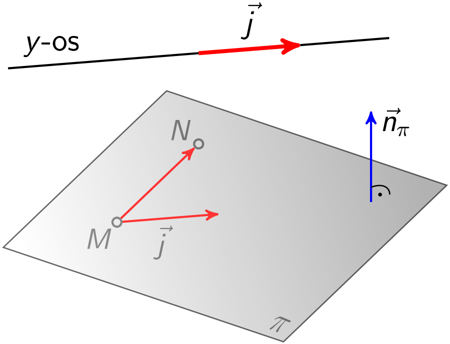
$$A(x-x_0) + B(y-y_0) + C(z-z_0) = 0$$

$$-1 \cdot (x-3) + 0 \cdot (y-4) + 5 \cdot$$



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Opći oblik

$$\begin{array}{c} x_0 \; y_0 \; z_0 \\ M(3,4,-1) \end{array}$$

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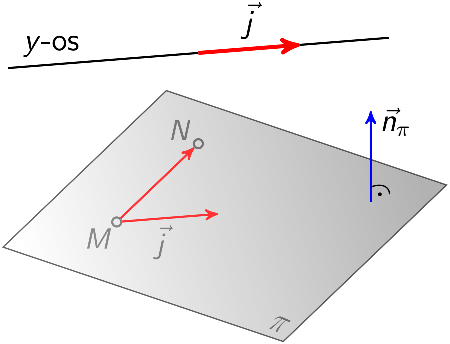

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Opći oblik

$$\begin{array}{c} x_0 \; y_0 \;\; z_0 \\ M(3,\,4,\,-1) \end{array}$$

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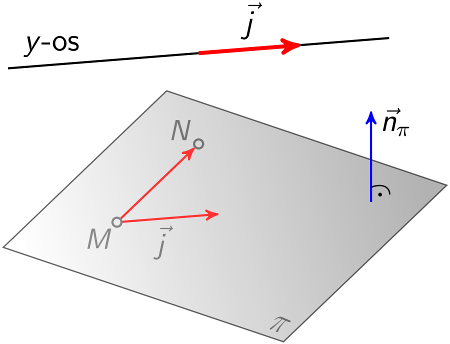

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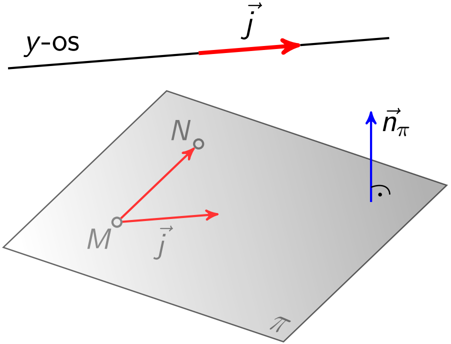

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Opći oblik

$$\begin{array}{c} x_0\ \ y_0\ \ z_0 \\ M(3,4,-1) \end{array}$$

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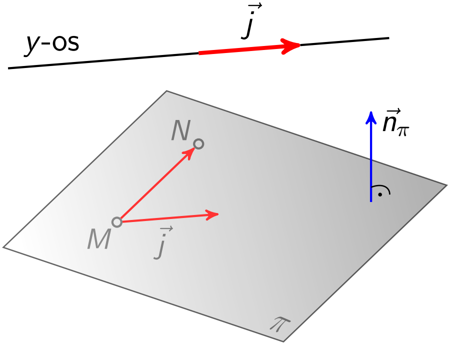
$$\vec{n}_\pi = \vec{j} \times \overrightarrow{MN} = \begin{vmatrix} \vec{i} & \vec{j} & \vec{k} \\ 0 & 1 & 0 \\ -5 & -7 & -1 \end{vmatrix} = \begin{array}{c} A\ \ B\ \ C \\ (-1,0,5) \end{array}$$

$$A(x-x_0) + B(y-y_0) + C(z-z_0) = 0$$

$$-1\cdot(x-3) + 0\cdot(y-4) + 5\cdot(z-(-1)) = 0$$

$$-x + 5z + 8 = 0$$



$$M(3,4,-1), \quad N(-2,-3,-2)$$

$$\overrightarrow{MN} = (-5,-7,-1)$$

$$\vec{j} = (0,1,0)$$

Opći oblik

$$\begin{array}{c} x_0 \;\; y_0 \;\; z_0 \\ M(3,\ 4,\ -1) \end{array}$$

$$\pi \ldots \ M, \ \vec{n}_\pi$$

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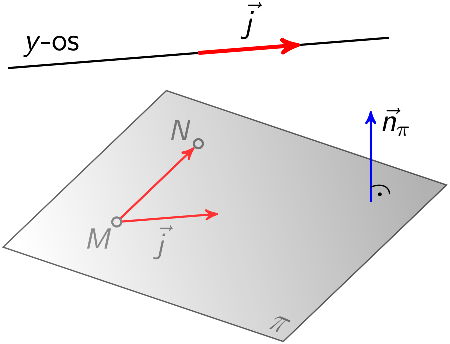
$$A(x-x_0)+B(y-y_0)+C(z-z_0)=0$$

$$-1\cdot(x-3)+0\cdot(y-4)+5\cdot(z-(-1))=0$$

$$\pi \ldots \ -x+5z+8=0$$



$M(3,4,-1), \quad N(-2,-3,-2)$

$\overrightarrow{MN} = (-5,-7,-1)$

$\vec{j} = (0,1,0)$

Opći oblik

$$\begin{array}{c} \color{blue}{x_0 \ y_0 \ z_0} \\ M(3,4,-1) \end{array}$$

$\pi \ldots \ M, \ \vec{n}_\pi$

$$\vec{n}_\pi = \vec{j} \times \overrightarrow{MN} = \begin{vmatrix} \vec{i} & \vec{j} & \vec{k} \\ 0 & 1 & 0 \\ -5 & -7 & -1 \end{vmatrix} = \begin{array}{c} \color{blue}{A \ \ B \ C} \\ (-1,0,5) \end{array}$$

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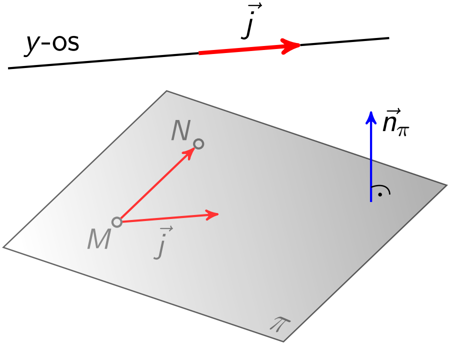
$$-1 \cdot (x-3) + 0 \cdot (y-4) + 5 \cdot (z-(-1)) = 0$$

$$\boxed{\pi \ldots \ -x + 5z + 8 = 0}$$



$$M(3,4,-1), \quad N(-2,-3,-2)$$

$$\overrightarrow{MN} = (-5,-7,-1)$$

$$\vec{j} = (0,1,0)$$

Opći oblik

$$M(\overset{x_0}{3}, \overset{y_0}{4}, \overset{z_0}{-1})$$

$$\pi \ldots M,\ \vec{n}_\pi$$

$$\vec{n}_\pi = \vec{j} \times \overrightarrow{MN} = \begin{vmatrix} \vec{i} & \vec{j} & \vec{k} \\ 0 & 1 & 0 \\ -5 & -7 & -1 \end{vmatrix} = (\overset{A}{-1}, \overset{B}{0}, \overset{C}{5})$$

$$A(x-x_0) + B(y-y_0) + C(z-z_0) = 0$$

$$-1 \cdot (x-3) + 0 \cdot (y-4) + 5 \cdot (z-(-1)) = 0$$

Ova ravnina nema segmentni oblik

$$\boxed{\pi \ldots \ -x + 5z + 8 = 0}$$

Normalni oblik

$$x \cos \alpha + y \cos \beta + z \cos \gamma - \delta = 0$$

Normalni oblik

$$x \cos\alpha + y \cos\beta + z \cos\gamma - \delta = 0$$

Opći oblik

$$Ax + By + Cz + D = 0$$

Normalni oblik

$$x \cos\alpha + y \cos\beta + z \cos\gamma - \delta = 0$$

Opći oblik

$$Ax + By + Cz + D = 0$$

$$-x + 5z + 8 = 0$$

Normalni oblik

$$x \cos \alpha + y \cos \beta + z \cos \gamma - \delta = 0$$

Opći oblik

$$Ax + By + Cz + D = 0$$

$$-x + 5z + 8 = 0$$

$$\vec{n}_\pi = (-1, 0, 5)$$

Normalni oblik

$$x \cos\alpha + y \cos\beta + z \cos\gamma - \delta = 0$$

Opći oblik

$$Ax + By + Cz + D = 0$$

$$-x + 5z + 8 = 0$$

$$\vec{n}_\pi = (\overset{A}{-1}, \overset{B}{0}, \overset{C}{5})$$

Normalni oblik

$$x \cos\alpha + y \cos\beta + z \cos\gamma - \delta = 0$$

Opći oblik

$$Ax + By + Cz + D = 0$$

$$-x + 5z + 8 = 0$$

$$\vec{n}_\pi = (\overset{A}{-1}, \overset{B}{0}, \overset{C}{5}) \qquad D = 8$$

Normalni oblik

$$x \cos\alpha + y \cos\beta + z \cos\gamma - \delta = 0$$

Opći oblik

$$Ax + By + Cz + D = 0$$

$$-x + 5z + 8 = 0$$

$$\vec{n}_\pi = (\overset{A}{-1}, \overset{B}{0}, \overset{C}{5}) \qquad D = 8$$

$$\lambda = \frac{1}{-\operatorname{sign} D \cdot \sqrt{A^2 + B^2 + C^2}}$$

Normalni oblik

$$x\cos\alpha + y\cos\beta + z\cos\gamma - \delta = 0$$

Opći oblik

$$Ax + By + Cz + D = 0$$

$$-x + 5z + 8 = 0$$

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Normalni oblik

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Normalni oblik

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Opći oblik

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$$\lambda = \frac{1}{\qquad\qquad\qquad\qquad}$$

Normalni oblik

$$x \cos\alpha + y \cos\beta + z \cos\gamma - \delta = 0$$

Opći oblik

$$Ax + By + Cz + D = 0$$

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$$\lambda = \frac{1}{-\operatorname{sign} D \cdot \sqrt{A^2 + B^2 + C^2}}$$

$$\lambda = \frac{1}{-\operatorname{sign} 8}$$

Normalni oblik

$$x \cos\alpha + y \cos\beta + z \cos\gamma - \delta = 0$$

Opći oblik

$$Ax + By + Cz + D = 0$$

$$-x + 5z + 8 = 0$$

$$\vec{n}_\pi = (\overset{\color{blue}A}{-1}, \overset{\color{blue}B}{0}, \overset{\color{blue}C}{5}) \qquad D = 8$$

$$\lambda = \frac{1}{-\operatorname{sign} D \cdot \sqrt{A^2 + B^2 + C^2}}$$

$$\lambda = \frac{1}{-\operatorname{sign} 8 \cdot \sqrt{}}$$

Normalni oblik

$$x\cos\alpha + y\cos\beta + z\cos\gamma - \delta = 0$$

Opći oblik

$$Ax + By + Cz + D = 0$$

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$$\vec{n}_\pi = (\overset{A}{-1}, \overset{B}{0}, \overset{C}{5}) \qquad D = 8$$

$$\lambda = \frac{1}{-\operatorname{sign} D \cdot \sqrt{A^2 + B^2 + C^2}}$$

$$\lambda = \frac{1}{-\operatorname{sign} 8 \cdot \sqrt{(-1)^2}}$$

Normalni oblik

$$x \cos\alpha + y \cos\beta + z \cos\gamma - \delta = 0$$

Opći oblik

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$$\lambda = \frac{1}{-\operatorname{sign} 8 \cdot \sqrt{(-1)^2 + 0^2}}$$

Normalni oblik

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Opći oblik

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Normalni oblik

$$x \cos\alpha + y \cos\beta + z \cos\gamma - \delta = 0$$

Opći oblik

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$$\lambda = \frac{1}{-\operatorname{sign} 8 \cdot \sqrt{(-1)^2 + 0^2 + 5^2}}$$

$$\lambda =$$

Normalni oblik

$$x\cos\alpha + y\cos\beta + z\cos\gamma - \delta = 0$$

Opći oblik

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$$\lambda = \frac{\quad}{\quad}$$

Normalni oblik

$$x \cos\alpha + y \cos\beta + z \cos\gamma - \delta = 0$$

Opći oblik

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$$\lambda = \frac{1}{\quad}$$

Normalni oblik

$$x \cos\alpha + y \cos\beta + z \cos\gamma - \delta = 0$$

Opći oblik

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$$\lambda = \frac{1}{-\operatorname{sign} D \cdot \sqrt{A^2 + B^2 + C^2}}$$

$$\lambda = \frac{1}{-\operatorname{sign} 8 \cdot \sqrt{(-1)^2 + 0^2 + 5^2}}$$

$$\lambda = \frac{1}{-1}$$

Normalni oblik

$$x\cos\alpha + y\cos\beta + z\cos\gamma - \delta = 0$$

Opći oblik

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$$\lambda = \frac{1}{-\operatorname{sign} D \cdot \sqrt{A^2 + B^2 + C^2}}$$

$$\lambda = \frac{1}{-\operatorname{sign} 8 \cdot \sqrt{(-1)^2 + 0^2 + 5^2}}$$

$$\lambda = \frac{1}{-1 \cdot \sqrt{26}}$$

Normalni oblik

$$x\cos\alpha + y\cos\beta + z\cos\gamma - \delta = 0$$

Opći oblik

$$Ax + By + Cz + D = 0$$

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$$\vec{n}_\pi = (\overset{A}{-1}, \overset{B}{0}, \overset{C}{5}) \qquad D = 8$$

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$$\lambda = \frac{1}{-\operatorname{sign} 8 \cdot \sqrt{(-1)^2 + 0^2 + 5^2}}$$

$$\lambda = \frac{1}{-1 \cdot \sqrt{26}} \qquad \lambda = \frac{-1}{\sqrt{26}}$$

Normalni oblik

$$x\cos\alpha + y\cos\beta + z\cos\gamma - \delta = 0$$

Opći oblik

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$$\lambda = \frac{1}{-1 \cdot \sqrt{26}} \qquad \boxed{\lambda = \frac{-1}{\sqrt{26}}}$$

Normalni oblik

$$x \cos\alpha + y \cos\beta + z \cos\gamma - \delta = 0$$

$$-x + 5z + 8 = 0$$

Opći oblik

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$$\lambda = \frac{1}{-\operatorname{sign} 8 \cdot \sqrt{(-1)^2 + 0^2 + 5^2}}$$

$$\lambda = \frac{1}{-1 \cdot \sqrt{26}} \qquad \boxed{\lambda = \frac{-1}{\sqrt{26}}}$$

Normalni oblik

$$x\cos\alpha + y\cos\beta + z\cos\gamma - \delta = 0$$

$$-x + 5z + 8 = 0 \;\Big/ \cdot \frac{-1}{\sqrt{26}}$$

Opći oblik

$$Ax + By + Cz + D = 0$$

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$$\vec{n}_\pi = (\overset{A}{-1}, \overset{B}{0}, \overset{C}{5}) \qquad D = 8$$

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$$\lambda = \frac{1}{-\operatorname{sign} 8 \cdot \sqrt{(-1)^2 + 0^2 + 5^2}}$$

$$\lambda = \frac{1}{-1 \cdot \sqrt{26}} \qquad \boxed{\lambda = \frac{-1}{\sqrt{26}}}$$

Normalni oblik

$$x\cos\alpha + y\cos\beta + z\cos\gamma - \delta = 0$$

$$-x + 5z + 8 = 0 \;\Big/ \cdot \frac{-1}{\sqrt{26}}$$

$$\frac{1}{\sqrt{26}}x$$

Opći oblik

$$Ax + By + Cz + D = 0$$

$$-x + 5z + 8 = 0$$

$$\vec{n}_\pi = (\overset{A}{-1}, \overset{B}{0}, \overset{C}{5}) \qquad D = 8$$

$$\lambda = \frac{1}{-\operatorname{sign} D \cdot \sqrt{A^2 + B^2 + C^2}}$$

$$\lambda = \frac{1}{-\operatorname{sign} 8 \cdot \sqrt{(-1)^2 + 0^2 + 5^2}}$$

$$\lambda = \frac{1}{-1 \cdot \sqrt{26}} \qquad \boxed{\lambda = \frac{-1}{\sqrt{26}}}$$

Normalni oblik

$$x\cos\alpha + y\cos\beta + z\cos\gamma - \delta = 0$$

$$-x + 5z + 8 = 0 \Big/ \cdot \frac{-1}{\sqrt{26}}$$

$$\frac{1}{\sqrt{26}}x - \frac{5}{\sqrt{26}}z$$

Opći oblik

$$Ax + By + Cz + D = 0$$

$$-x + 5z + 8 = 0$$

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$$\lambda = \frac{1}{-\operatorname{sign} 8 \cdot \sqrt{(-1)^2 + 0^2 + 5^2}}$$

$$\lambda = \frac{1}{-1 \cdot \sqrt{26}} \qquad \boxed{\lambda = \frac{-1}{\sqrt{26}}}$$

Normalni oblik

$$x \cos\alpha + y\cos\beta + z\cos\gamma - \delta = 0$$

$$-x + 5z + 8 = 0 \;\Big/ \cdot \frac{-1}{\sqrt{26}}$$

$$\frac{1}{\sqrt{26}}x - \frac{5}{\sqrt{26}}z - \frac{8}{\sqrt{26}}$$

Opći oblik

$$Ax + By + Cz + D = 0$$

$$-x + 5z + 8 = 0$$

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$$\lambda = \frac{1}{-\operatorname{sign} 8 \cdot \sqrt{(-1)^2 + 0^2 + 5^2}}$$

$$\lambda = \frac{1}{-1 \cdot \sqrt{26}} \qquad \boxed{\lambda = \frac{-1}{\sqrt{26}}}$$

Normalni oblik

$$x\cos\alpha + y\cos\beta + z\cos\gamma - \delta = 0$$

$$-x + 5z + 8 = 0 \;\Big/ \cdot \frac{-1}{\sqrt{26}}$$

$$\frac{1}{\sqrt{26}}x - \frac{5}{\sqrt{26}}z - \frac{8}{\sqrt{26}} = 0$$

Opći oblik

$$Ax + By + Cz + D = 0$$

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$$\lambda = \frac{1}{-\operatorname{sign} 8 \cdot \sqrt{(-1)^2 + 0^2 + 5^2}}$$

$$\lambda = \frac{1}{-1 \cdot \sqrt{26}} \qquad \boxed{\lambda = \frac{-1}{\sqrt{26}}}$$

Normalni oblik

$$x\cos\alpha + y\cos\beta + z\cos\gamma - \delta = 0$$

$$-x + 5z + 8 = 0 \;\Big/ \cdot \frac{-1}{\sqrt{26}}$$

$$\boxed{\frac{1}{\sqrt{26}}x - \frac{5}{\sqrt{26}}z - \frac{8}{\sqrt{26}} = 0}$$

Opći oblik

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$$\lambda = \frac{1}{-\operatorname{sign} D \cdot \sqrt{A^2 + B^2 + C^2}}$$

$$\lambda = \frac{1}{-\operatorname{sign} 8 \cdot \sqrt{(-1)^2 + 0^2 + 5^2}}$$

$$\lambda = \frac{1}{-1 \cdot \sqrt{26}} \qquad \boxed{\lambda = \frac{-1}{\sqrt{26}}}$$

Normalni oblik

$$x\cos\alpha + y\cos\beta + z\cos\gamma - \delta = 0$$

$$-x + 5z + 8 = 0 \ \Big/ \cdot \frac{-1}{\sqrt{26}}$$

$$\boxed{\frac{1}{\sqrt{26}}x - \frac{5}{\sqrt{26}}z - \frac{8}{\sqrt{26}} = 0}$$

$$\cos\alpha = \frac{1}{\sqrt{26}}$$

Opći oblik

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$$\vec{n}_\pi = (\overset{A}{-1}, \overset{B}{0}, \overset{C}{5}) \qquad D = 8$$

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$$\lambda = \frac{1}{-\operatorname{sign} 8 \cdot \sqrt{(-1)^2 + 0^2 + 5^2}}$$

$$\lambda = \frac{1}{-1 \cdot \sqrt{26}} \qquad \boxed{\lambda = \frac{-1}{\sqrt{26}}}$$

Normalni oblik

$$x \cos\alpha + y\cos\beta + z\cos\gamma - \delta = 0$$

$$-x + 5z + 8 = 0 \;\Big/ \cdot \frac{-1}{\sqrt{26}}$$

$$\boxed{\frac{1}{\sqrt{26}}x - \frac{5}{\sqrt{26}}z - \frac{8}{\sqrt{26}} = 0}$$

$$\cos\alpha = \frac{1}{\sqrt{26}}$$

$$\cos\beta = 0$$

Opći oblik

$$Ax + By + Cz + D = 0$$

$$-x + 5z + 8 = 0$$

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$$\lambda = \frac{1}{-\operatorname{sign} D \cdot \sqrt{A^2 + B^2 + C^2}}$$

$$\lambda = \frac{1}{-\operatorname{sign} 8 \cdot \sqrt{(-1)^2 + 0^2 + 5^2}}$$

$$\lambda = \frac{1}{-1 \cdot \sqrt{26}} \qquad \boxed{\lambda = \frac{-1}{\sqrt{26}}}$$

Normalni oblik

$$x\cos\alpha + y\cos\beta + z\cos\gamma - \delta = 0$$

$$-x + 5z + 8 = 0 \;\Big/ \cdot \frac{-1}{\sqrt{26}}$$

$$\boxed{\frac{1}{\sqrt{26}}x - \frac{5}{\sqrt{26}}z - \frac{8}{\sqrt{26}} = 0}$$

$$\cos\alpha = \frac{1}{\sqrt{26}}$$

$$\cos\beta = 0$$

$$\cos\gamma = -\frac{5}{\sqrt{26}}$$

Opći oblik

$$Ax + By + Cz + D = 0$$

$$-x + 5z + 8 = 0$$

$$\vec{n}_\pi = (\overset{A}{-1}, \overset{B}{0}, \overset{C}{5}) \qquad D = 8$$

$$\lambda = \frac{1}{-\operatorname{sign} D \cdot \sqrt{A^2 + B^2 + C^2}}$$

$$\lambda = \frac{1}{-\operatorname{sign} 8 \cdot \sqrt{(-1)^2 + 0^2 + 5^2}}$$

$$\lambda = \frac{1}{-1 \cdot \sqrt{26}} \qquad \boxed{\lambda = \frac{-1}{\sqrt{26}}}$$

Normalni oblik

$$x\cos\alpha + y\cos\beta + z\cos\gamma - \delta = 0$$

$$-x + 5z + 8 = 0 \;\Big/ \cdot \frac{-1}{\sqrt{26}}$$

$$\boxed{\frac{1}{\sqrt{26}}x - \frac{5}{\sqrt{26}}z - \frac{8}{\sqrt{26}} = 0}$$

$$\cos\alpha = \frac{1}{\sqrt{26}}$$

$$\cos\beta = 0$$

$$\cos\gamma = -\frac{5}{\sqrt{26}}$$

$$\delta = \frac{8}{\sqrt{26}}$$

Opći oblik

$$Ax + By + Cz + D = 0$$

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$$\vec{n}_\pi = (\overset{A}{-1}, \overset{B}{0}, \overset{C}{5}) \qquad D = 8$$

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$$\lambda = \frac{1}{-\operatorname{sign} 8 \cdot \sqrt{(-1)^2 + 0^2 + 5^2}}$$

$$\lambda = \frac{1}{-1 \cdot \sqrt{26}} \qquad \boxed{\lambda = \frac{-1}{\sqrt{26}}}$$

Normalni oblik

$$x\cos\alpha + y\cos\beta + z\cos\gamma - \delta = 0$$

$$-x + 5z + 8 = 0 \;\Big/ \cdot \frac{-1}{\sqrt{26}}$$

$$\boxed{\frac{1}{\sqrt{26}}x - \frac{5}{\sqrt{26}}z - \frac{8}{\sqrt{26}} = 0}$$

$$\cos\alpha = \frac{1}{\sqrt{26}}$$

$$\cos\beta = 0$$

$$\cos\gamma = -\frac{5}{\sqrt{26}}$$

$$\boxed{\delta = \frac{8}{\sqrt{26}}}$$

Opći oblik

$$Ax + By + Cz + D = 0$$

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$$\lambda = \frac{1}{-1 \cdot \sqrt{26}} \qquad \boxed{\lambda = \frac{-1}{\sqrt{26}}}$$

Normalni oblik

$$x\cos\alpha + y\cos\beta + z\cos\gamma - \delta = 0$$

$$-x + 5z + 8 = 0 \;\Big/ \cdot \frac{-1}{\sqrt{26}}$$

$$\boxed{\frac{1}{\sqrt{26}}x - \frac{5}{\sqrt{26}}z - \frac{8}{\sqrt{26}} = 0}$$

$$\cos\alpha = \frac{1}{\sqrt{26}}$$

$$\cos\beta = 0$$

$$\cos\gamma = -\frac{5}{\sqrt{26}}$$

$$\boxed{\delta = \frac{8}{\sqrt{26}}}$$

udaljenost ravnine od ishodišta

Opći oblik

$$Ax + By + Cz + D = 0$$

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$$\lambda = \frac{1}{-\operatorname{sign} 8 \cdot \sqrt{(-1)^2 + 0^2 + 5^2}}$$

$$\lambda = \frac{1}{-1 \cdot \sqrt{26}} \qquad \boxed{\lambda = \frac{-1}{\sqrt{26}}}$$

Normalni oblik

$$x\cos\alpha + y\cos\beta + z\cos\gamma - \delta = 0$$

$$-x + 5z + 8 = 0 \;\Big/ \cdot \frac{-1}{\sqrt{26}}$$

$$\boxed{\frac{1}{\sqrt{26}}x - \frac{5}{\sqrt{26}}z - \frac{8}{\sqrt{26}} = 0}$$

$$\vec{n}_0 = -\frac{1}{\sqrt{26}}\vec{n}_\pi$$

$$\cos\alpha = \frac{1}{\sqrt{26}}$$

$$\cos\beta = 0$$

$$\cos\gamma = -\frac{5}{\sqrt{26}}$$

$$\boxed{\delta = \frac{8}{\sqrt{26}}}$$

udaljenost ravnine od ishodišta

Opći oblik

$$Ax + By + Cz + D = 0$$

$$-x + 5z + 8 = 0$$

$$\vec{n}_\pi = (\overset{A}{-1}, \overset{B}{0}, \overset{C}{5}) \qquad D = 8$$

$$\lambda = \frac{1}{-\operatorname{sign} D \cdot \sqrt{A^2 + B^2 + C^2}}$$

$$\lambda = \frac{1}{-\operatorname{sign} 8 \cdot \sqrt{(-1)^2 + 0^2 + 5^2}}$$

$$\lambda = \frac{1}{-1 \cdot \sqrt{26}} \qquad \boxed{\lambda = \frac{-1}{\sqrt{26}}}$$

Normalni oblik

$$x\cos\alpha + y\cos\beta + z\cos\gamma - \delta = 0$$

$$-x + 5z + 8 = 0 \;\Big/ \cdot \frac{-1}{\sqrt{26}}$$

$$\boxed{\frac{1}{\sqrt{26}}x - \frac{5}{\sqrt{26}}z - \frac{8}{\sqrt{26}} = 0}$$

$$\vec{n}_0 = -\frac{1}{\sqrt{26}}\vec{n}_\pi$$

$$\cos\alpha = \frac{1}{\sqrt{26}}$$

$$\cos\beta = 0$$

$$\cos\gamma = -\frac{5}{\sqrt{26}}$$

kosinusi smjera od $\vec{n}_0$ i od $-\vec{n}_\pi$

$$\boxed{\delta = \frac{8}{\sqrt{26}}}$$

udaljenost ravnine od ishodišta

Opći oblik

$$Ax + By + Cz + D = 0$$

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$$\lambda = \frac{1}{-\operatorname{sign} 8 \cdot \sqrt{(-1)^2 + 0^2 + 5^2}}$$

$$\lambda = \frac{1}{-1 \cdot \sqrt{26}} \qquad \boxed{\lambda = \frac{-1}{\sqrt{26}}}$$

$\pi \cap x$-os

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$$\pi \ldots \; -x + 5z + 8 = 0$$

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$x\text{-os} \ldots \begin{cases} x = t \\ y = 0 \\ z = 0 \end{cases}$

$\pi \cap x$-os

$$\pi \ldots \; -x + 5z + 8 = 0$$

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$\pi \cap x$-os

$\pi \ldots \; -x + 5z + 8 = 0$

$$x\text{-os} \ldots \; \begin{cases} x = t \\ y = 0 \\ z = 0 \end{cases}$$

$$-x + 5z + 8 = 0$$

$$-t + 5 \cdot 0 + 8 = 0$$

$\pi \cap x$-os

$$\pi \ldots \; -x + 5z + 8 = 0$$

$$x\text{-os} \ldots \begin{cases} x = t \\ y = 0 \\ z = 0 \end{cases}$$

$$-x + 5z + 8 = 0$$

$$-t + 5 \cdot 0 + 8 = 0$$

$$t = 8$$

$\pi \cap x$-os

$\pi \ldots \; -x + 5z + 8 = 0$

$$x\text{-os} \ldots \begin{cases} x = t \\ y = 0 \\ z = 0 \end{cases}$$

$$-x + 5z + 8 = 0$$
$$-t + 5 \cdot 0 + 8 = 0$$
$$t = 8$$

$$T_1(8, 0, 0)$$

$\pi \cap x$-os

$\pi \cap z$-os

$\pi \ldots \; -x + 5z + 8 = 0$

$$x\text{-os} \ldots \begin{cases} x = t \\ y = 0 \\ z = 0 \end{cases}$$

$$-x + 5z + 8 = 0$$

$$-t + 5 \cdot 0 + 8 = 0$$

$$t = 8$$

$$T_1(8, 0, 0)$$

$\boxed{\pi \cap x\text{-os}}$

$\pi \ldots \; -x + 5z + 8 = 0$

$$x\text{-os} \ldots \begin{cases} x = t \\ y = 0 \\ z = 0 \end{cases}$$

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$$-t + 5 \cdot 0 + 8 = 0$$

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$$T_1(8, 0, 0)$$

$\boxed{\pi \cap z\text{-os}}$

$\pi \ldots \; -x + 5z + 8 = 0$

$\pi \cap x$-os

$\pi \ldots \; -x + 5z + 8 = 0$

$$x\text{-os} \ldots \begin{cases} x = t \\ y = 0 \\ z = 0 \end{cases}$$

$$-x + 5z + 8 = 0$$

$$-t + 5 \cdot 0 + 8 = 0$$

$$t = 8$$

$$T_1(8, 0, 0)$$

$\pi \cap z$-os

$\pi \ldots \; -x + 5z + 8 = 0$

$$z\text{-os} \ldots \begin{cases} x = 0 \\ y = 0 \\ z = t \end{cases}$$

$\pi \cap x$-os

$\pi \ldots -x + 5z + 8 = 0$

$$x\text{-os} \ldots \begin{cases} x = t \\ y = 0 \\ z = 0 \end{cases}$$

$$-x + 5z + 8 = 0$$

$$-t + 5 \cdot 0 + 8 = 0$$

$$t = 8$$

$$T_1(8, 0, 0)$$

$\pi \cap z$-os

$\pi \ldots -x + 5z + 8 = 0$

$$z\text{-os} \ldots \begin{cases} x = 0 \\ y = 0 \\ z = t \end{cases}$$

$$-x + 5z + 8 = 0$$

$\pi \cap x$-os

$$\pi \ldots \; -x + 5z + 8 = 0$$

$$x\text{-os} \ldots \; \begin{cases} x = t \\ y = 0 \\ z = 0 \end{cases}$$

$$-x + 5z + 8 = 0$$

$$-t + 5 \cdot 0 + 8 = 0$$

$$t = 8$$

$$T_1(8, 0, 0)$$

$\pi \cap z$-os

$$\pi \ldots \; -x + 5z + 8 = 0$$

$$z\text{-os} \ldots \; \begin{cases} x = 0 \\ y = 0 \\ z = t \end{cases}$$

$$-x + 5z + 8 = 0$$

$$0 + 5t + 8 = 0$$

$\pi \cap x$-os

$$\pi \ldots \; -x + 5z + 8 = 0$$

$$x\text{-os} \ldots \begin{cases} x = t \\ y = 0 \\ z = 0 \end{cases}$$

$$-x + 5z + 8 = 0$$

$$-t + 5 \cdot 0 + 8 = 0$$

$$t = 8$$

$$T_1(8, 0, 0)$$

$\pi \cap z$-os

$$\pi \ldots \; -x + 5z + 8 = 0$$

$$z\text{-os} \ldots \begin{cases} x = 0 \\ y = 0 \\ z = t \end{cases}$$

$$-x + 5z + 8 = 0$$

$$0 + 5t + 8 = 0$$

$$t = -\frac{8}{5}$$

$\pi \cap x$-os

$\pi \ldots \ -x + 5z + 8 = 0$

$$x\text{-os} \ldots \begin{cases} x = t \\ y = 0 \\ z = 0 \end{cases}$$

$$-x + 5z + 8 = 0$$
$$-t + 5 \cdot 0 + 8 = 0$$
$$t = 8$$

$$T_1(8, 0, 0)$$

$\pi \cap z$-os

$\pi \ldots \ -x + 5z + 8 = 0$

$$z\text{-os} \ldots \begin{cases} x = 0 \\ y = 0 \\ z = t \end{cases}$$

$$-x + 5z + 8 = 0$$
$$0 + 5t + 8 = 0$$
$$t = -\frac{8}{5}$$

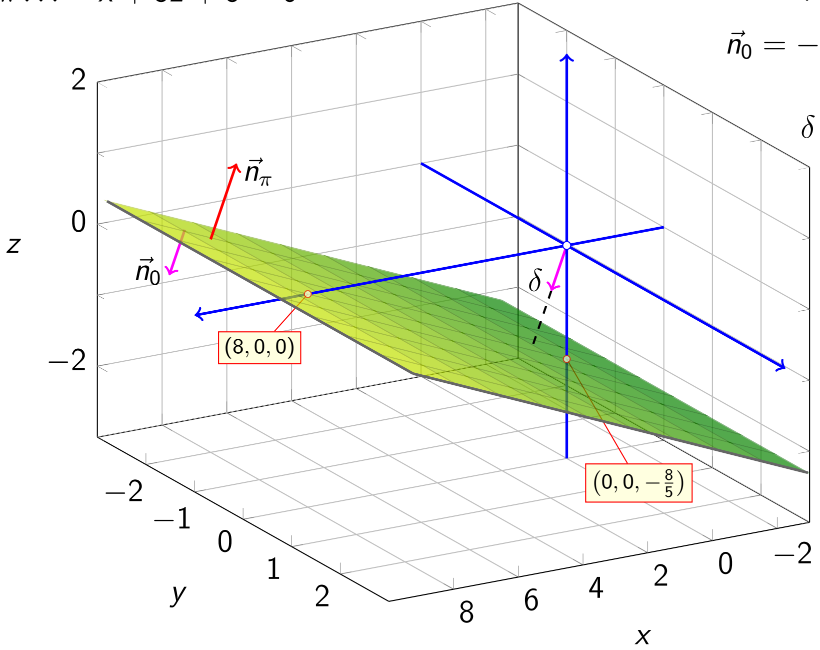
$$T_2\left(0, 0, -\frac{8}{5}\right)$$

$\pi \ldots \; -x + 5z + 8 = 0$

$\vec{n}_\pi = (-1, 0, 5)$

$\vec{n}_0 = -\frac{1}{\sqrt{26}} \vec{n}_\pi$

$\delta = \frac{8}{\sqrt{26}}$



Domaća zadaća

Odredite vrijednosti parametara u i v za koje se dobivaju presjeci ravnine π s koordinatnim osima u njezinim parametarskim jednadžbama

$$\pi \ldots \begin{cases} x = 3 - 5u \\ y = 4 - 7u + v. \\ z = -1 - u \end{cases}$$

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$T_1(8, 0, 0)$

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$$T_1(8, 0, 0) \rightsquigarrow u = -1, \;\; v = -11$$

$$T_2\left(0, 0, -\frac{8}{5}\right) \rightsquigarrow u = \frac{3}{5}, \;\; v = \frac{1}{5}$$

drugi zadatak

Zadatak 2

Nađite jednadžbu ravnine čija je normala $\vec{n} = 8\vec{i} + 9\vec{j} + \vec{k}$*, a udaljenost od ishodišta iznosi* 1.

Zadatak 2

Nađite jednadžbu ravnine čija je normala $\vec{n} = 8\vec{i} + 9\vec{j} + \vec{k}$, *a udaljenost od ishodišta iznosi* 1.

Rješenje

1. način

Zadatak 2

Nađite jednadžbu ravnine čija je normala $\vec{n} = 8\vec{i} + 9\vec{j} + \vec{k}$, *a udaljenost od ishodišta iznosi* 1.

Rješenje

1. način

$\pi \ldots x\cos\alpha + y\cos\beta + z\cos\gamma - \delta = 0$

Zadatak 2

Nađite jednadžbu ravnine čija je normala $\vec{n} = 8\vec{i} + 9\vec{j} + \vec{k}$*, a udaljenost od ishodišta iznosi* 1*.*

Rješenje

$\boxed{\text{1. način}}$ $\quad \vec{n} = (8, 9, 1)$

$\pi \ldots\ x \cos\alpha + y \cos\beta + z \cos\gamma - \delta = 0$

Zadatak 2

Nađite jednadžbu ravnine čija je normala $\vec{n} = 8\vec{i} + 9\vec{j} + \vec{k}$, *a udaljenost od ishodišta iznosi* 1.

Rješenje

$\boxed{\text{1. način}}$ $\vec{n} = (8, 9, 1),\ \delta = 1$

$\pi \ldots x\cos\alpha + y\cos\beta + z\cos\gamma - \delta = 0$

Zadatak 2

Nađite jednadžbu ravnine čija je normala $\vec{n} = 8\vec{i} + 9\vec{j} + \vec{k}$*, a udaljenost od ishodišta iznosi* 1.

Rješenje

$\boxed{\text{1. način}}$ $\vec{n} = (8, 9, 1),\ \delta = 1$

$|\vec{n}| =$

$\pi \ldots\ x \cos\alpha + y \cos\beta + z \cos\gamma - \delta = 0$

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Nađite jednadžbu ravnine čija je normala $\vec{n} = 8\vec{i} + 9\vec{j} + \vec{k}$, *a udaljenost od ishodišta iznosi* 1.

Rješenje

$\boxed{\text{1. način}}$ $\quad \vec{n} = (8, 9, 1), \;\; \delta = 1$

$$|\vec{n}| = \sqrt{8^2 + 9^2 + 1^2}$$

$\pi \ldots \; x \cos\alpha + y \cos\beta + z \cos\gamma - \delta = 0$

Zadatak 2

Nađite jednadžbu ravnine čija je normala $\vec{n} = 8\vec{i} + 9\vec{j} + \vec{k}$*, a udaljenost od ishodišta iznosi* 1*.*

Rješenje

$\boxed{\text{1. način}}$ $\vec{n} = (8, 9, 1),\ \delta = 1$

$$|\vec{n}| = \sqrt{8^2 + 9^2 + 1^2}$$

$$\pi \ldots\ x\cos\alpha + y\cos\beta + z\cos\gamma - \delta = 0$$

$$|\vec{n}| = \sqrt{146}$$

Zadatak 2

Nađite jednadžbu ravnine čija je normala $\vec{n} = 8\vec{i} + 9\vec{j} + \vec{k}$, *a udaljenost od ishodišta iznosi* 1.

Rješenje

1. način $\quad \vec{n} = (8, 9, 1), \ \delta = 1$

$$|\vec{n}| = \sqrt{8^2 + 9^2 + 1^2}$$

$$\pi \ldots x\cos\alpha + y\cos\beta + z\cos\gamma - \delta = 0$$

$$|\vec{n}| = \sqrt{146}$$

$$\vec{n}_0 = \frac{\vec{n}}{|\vec{n}|}$$

Zadatak 2

Nađite jednadžbu ravnine čija je normala $\vec{n} = 8\vec{i} + 9\vec{j} + \vec{k}$, a udaljenost od ishodišta iznosi 1.

Rješenje

$\boxed{1.\,\text{način}}$ $\quad \vec{n} = (8, 9, 1), \ \delta = 1$

$\pi \ldots \ x\cos\alpha + y\cos\beta + z\cos\gamma - \delta = 0$

$$|\vec{n}| = \sqrt{8^2 + 9^2 + 1^2}$$

$$|\vec{n}| = \sqrt{146}$$

$$\vec{n}_0 = \frac{\vec{n}}{|\vec{n}|} = \left(\frac{8}{\sqrt{146}}, \frac{9}{\sqrt{146}}, \frac{1}{\sqrt{146}}\right)$$

Zadatak 2

Nađite jednadžbu ravnine čija je normala $\vec{n} = 8\vec{i} + 9\vec{j} + \vec{k}$, a udaljenost od ishodišta iznosi 1.

Rješenje

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$\pi \ldots$

$$\vec{n}_0 = \frac{\vec{n}}{|\vec{n}|} = \left(\frac{8}{\sqrt{146}}, \frac{9}{\sqrt{146}}, \frac{1}{\sqrt{146}} \right)$$

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$$|\vec{n}| = \sqrt{146}$$

$\pi \ldots \frac{8}{\sqrt{146}}x$

$$\vec{n}_0 = \frac{\vec{n}}{|\vec{n}|} = \left(\frac{8}{\sqrt{146}}, \frac{9}{\sqrt{146}}, \frac{1}{\sqrt{146}}\right)$$

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Rješenje

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$$|\vec{n}| = \sqrt{8^2 + 9^2 + 1^2}$$

$$|\vec{n}| = \sqrt{146}$$

$\pi \ldots\ x\cos\alpha + y\cos\beta + z\cos\gamma - \delta = 0$

$\pi \ldots\ \frac{8}{\sqrt{146}}x + \frac{9}{\sqrt{146}}y$

$$\vec{n}_0 = \frac{\vec{n}}{|\vec{n}|} = \left(\frac{8}{\sqrt{146}}, \frac{9}{\sqrt{146}}, \frac{1}{\sqrt{146}}\right)$$

Zadatak 2

Nađite jednadžbu ravnine čija je normala $\vec{n} = 8\vec{i} + 9\vec{j} + \vec{k}$, *a udaljenost od ishodišta iznosi* 1.

Rješenje

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$$\pi \ldots \ x \cos\alpha + y\cos\beta + z\cos\gamma - \delta = 0$$

$$|\vec{n}| = \sqrt{146}$$

$$\pi \ldots \ \frac{8}{\sqrt{146}}x + \frac{9}{\sqrt{146}}y + \frac{1}{\sqrt{146}}z$$

$$\vec{n}_0 = \frac{\vec{n}}{|\vec{n}|} = \left(\frac{8}{\sqrt{146}}, \frac{9}{\sqrt{146}}, \frac{1}{\sqrt{146}}\right)$$

Zadatak 2

Nađite jednadžbu ravnine čija je normala $\vec{n} = 8\vec{i} + 9\vec{j} + \vec{k}$, *a udaljenost od ishodišta iznosi* 1.

Rješenje

$\boxed{\text{1. način}}$ $\vec{n} = (8, 9, 1),\ \delta = 1$

$$|\vec{n}| = \sqrt{8^2 + 9^2 + 1^2}$$

$$|\vec{n}| = \sqrt{146}$$

$$\pi \ldots x \cos\alpha + y \cos\beta + z \cos\gamma - \delta = 0$$

$$\pi \ldots \frac{8}{\sqrt{146}}x + \frac{9}{\sqrt{146}}y + \frac{1}{\sqrt{146}}z - 1$$

$$\vec{n}_0 = \frac{\vec{n}}{|\vec{n}|} = \left(\frac{8}{\sqrt{146}}, \frac{9}{\sqrt{146}}, \frac{1}{\sqrt{146}}\right)$$

Zadatak 2

Nađite jednadžbu ravnine čija je normala $\vec{n} = 8\vec{i} + 9\vec{j} + \vec{k}$, *a udaljenost od ishodišta iznosi* 1.

Rješenje

$\boxed{\text{1. način}}$ $\vec{n} = (8, 9, 1),\ \delta = 1$

$$|\vec{n}| = \sqrt{8^2 + 9^2 + 1^2}$$

$$|\vec{n}| = \sqrt{146}$$

$\pi \ldots x\cos\alpha + y\cos\beta + z\cos\gamma - \delta = 0$

$\pi \ldots \dfrac{8}{\sqrt{146}}x + \dfrac{9}{\sqrt{146}}y + \dfrac{1}{\sqrt{146}}z - 1 = 0$

$$\vec{n}_0 = \frac{\vec{n}}{|\vec{n}|} = \left(\frac{8}{\sqrt{146}}, \frac{9}{\sqrt{146}}, \frac{1}{\sqrt{146}}\right)$$

Podrazumijevamo da se od ishodišta pomičemo u smjeru zadane normale poštujući njezinu orijentaciju jer u protivnom postoje dvije takve ravnine.

Zadatak 2

Nađite jednadžbu ravnine čija je normala $\vec{n} = 8\vec{i} + 9\vec{j} + \vec{k}$, a udaljenost od ishodišta iznosi 1.

Rješenje

1. način $\quad \vec{n} = (8, 9, 1),\ \delta = 1$

$$|\vec{n}| = \sqrt{8^2 + 9^2 + 1^2}$$

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$$\pi \ldots x \cos\alpha + y \cos\beta + z \cos\gamma - \delta = 0$$

$$\pi \ldots \frac{8}{\sqrt{146}} x + \frac{9}{\sqrt{146}} y + \frac{1}{\sqrt{146}} z - 1 = 0$$

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Zadatak 2

Nađite jednadžbu ravnine čija je normala $\vec{n} = 8\vec{i} + 9\vec{j} + \vec{k}$, *a udaljenost od ishodišta iznosi* 1.

$$\pi' \ldots \ \frac{8}{\sqrt{146}}x + \frac{9}{\sqrt{146}}y + \frac{1}{\sqrt{146}}z + 1 = 0$$

Rješenje

1. način $\quad \vec{n} = (8, 9, 1), \ \delta = 1$

$$|\vec{n}| = \sqrt{8^2 + 9^2 + 1^2}$$

$$|\vec{n}| = \sqrt{146}$$

$$\pi \ldots \ x\cos\alpha + y\cos\beta + z\cos\gamma - \delta = 0$$

$$\pi \ldots \ \frac{8}{\sqrt{146}}x + \frac{9}{\sqrt{146}}y + \frac{1}{\sqrt{146}}z - 1 = 0$$

$$\vec{n}_0 = \frac{\vec{n}}{|\vec{n}|} = \left(\frac{8}{\sqrt{146}}, \frac{9}{\sqrt{146}}, \frac{1}{\sqrt{146}}\right)$$

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Zadatak 2

Nađite jednadžbu ravnine čija je normala $\vec{n} = 8\vec{i} + 9\vec{j} + \vec{k}$, *a udaljenost od ishodišta iznosi* 1.

$$\pi' \ldots \frac{8}{\sqrt{146}}x + \frac{9}{\sqrt{146}}y + \frac{1}{\sqrt{146}}z + 1 = 0$$

Rješenje

1. način $\quad \vec{n} = (8, 9, 1), \ \delta = 1$

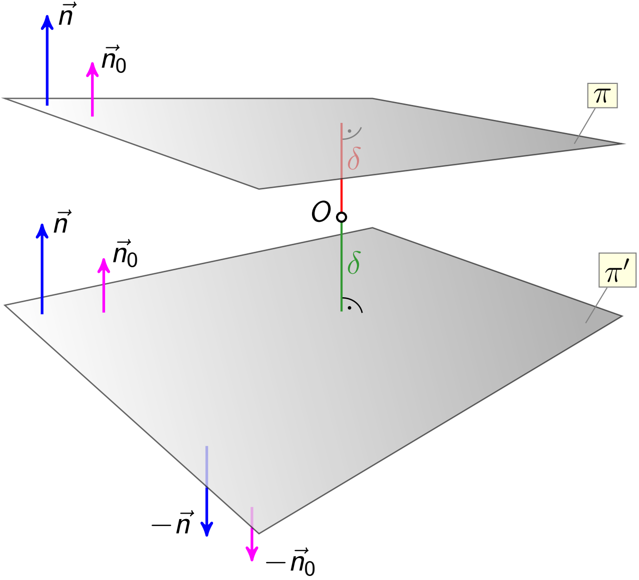
$$|\vec{n}| = \sqrt{8^2 + 9^2 + 1^2}$$

$$|\vec{n}| = \sqrt{146}$$

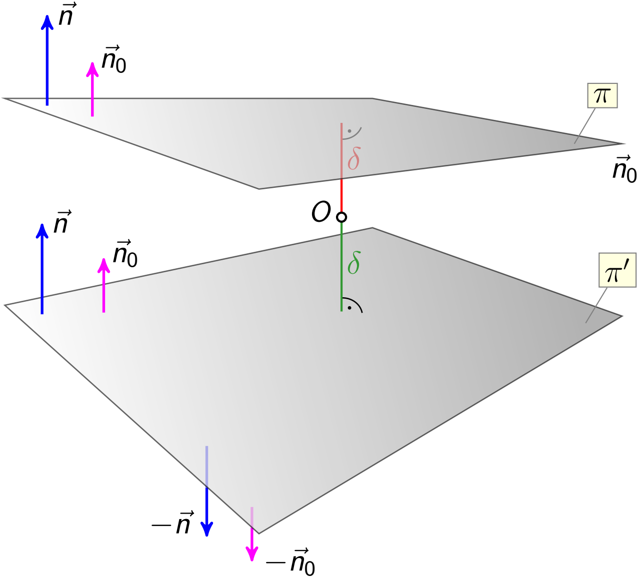
$$\pi \ldots x\cos\alpha + y\cos\beta + z\cos\gamma - \delta = 0$$

$$\boxed{\pi \ldots \frac{8}{\sqrt{146}}x + \frac{9}{\sqrt{146}}y + \frac{1}{\sqrt{146}}z - 1 = 0}$$

$$\vec{n}_0 = \frac{\vec{n}}{|\vec{n}|} = \left(\frac{8}{\sqrt{146}}, \frac{9}{\sqrt{146}}, \frac{1}{\sqrt{146}}\right)$$

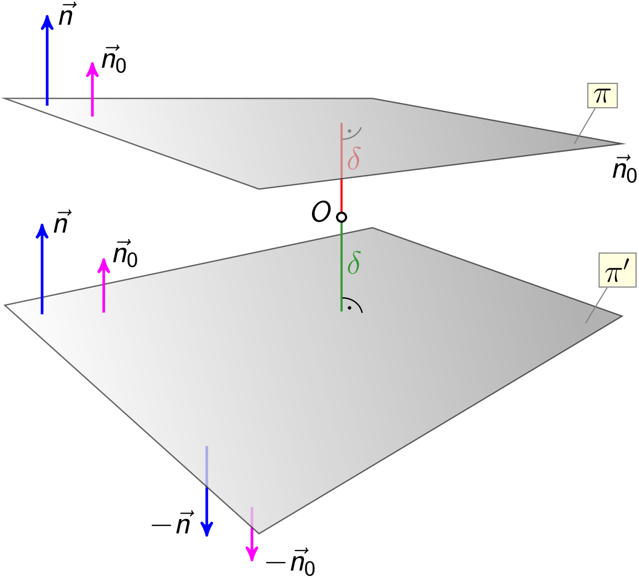


$\vec{n}$
$\vec{n}_0$
π
δ
O
$\vec{n}$
$\vec{n}_0$
δ
π'
$-\vec{n}$
$-\vec{n}_0$



$$\vec{n}_0 = (\cos\alpha, \cos\beta, \cos\gamma)$$

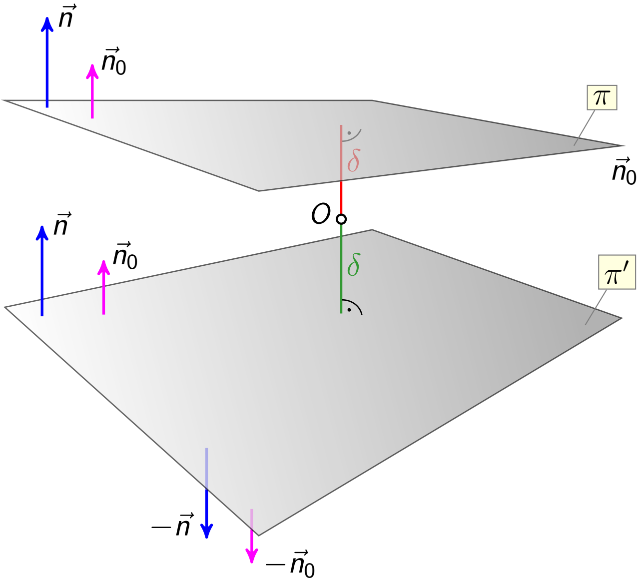
$$\pi \ldots\ x\cos\alpha + y\cos\beta + z\cos\gamma - \delta = 0$$



$$\vec{n}_0 = (\cos\alpha, \cos\beta, \cos\gamma)$$

$$\pi \ldots \; x\cos\alpha + y\cos\beta + z\cos\gamma - \delta = 0$$

normalni oblik



$$\vec{n}_0 = (\cos\alpha, \cos\beta, \cos\gamma)$$

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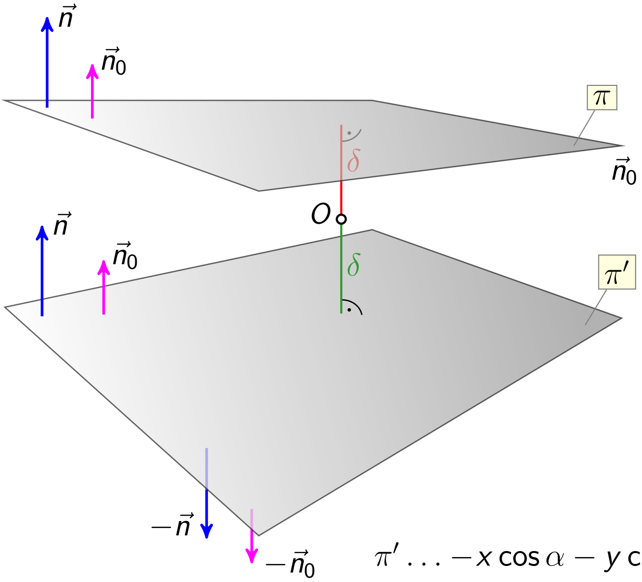
normalni oblik

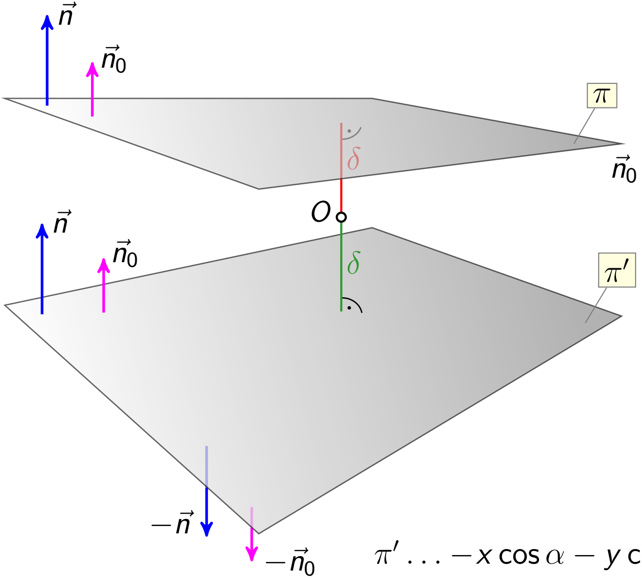


$$\vec{n}_0 = (\cos\alpha, \cos\beta, \cos\gamma)$$

$$\pi' \ldots \; -x\cos\alpha - y\cos\beta - z\cos\gamma - \delta = 0$$

$$\pi \ldots \; x\cos\alpha + y\cos\beta + z\cos\gamma - \delta = 0$$

normalni oblik



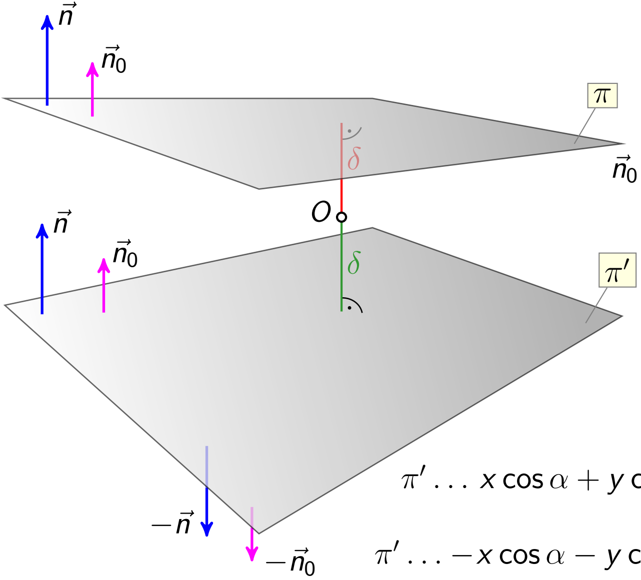
$$\vec{n}_0 = (\cos\alpha, \cos\beta, \cos\gamma)$$

$$\pi' \ldots \; -x\cos\alpha - y\cos\beta - z\cos\gamma - \delta = 0$$

normalni oblik

$$\pi \ldots\ x\cos\alpha + y\cos\beta + z\cos\gamma - \delta = 0$$

normalni oblik



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$$\pi' \ldots\ x\cos\alpha + y\cos\beta + z\cos\gamma + \delta = 0$$

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normalni oblik

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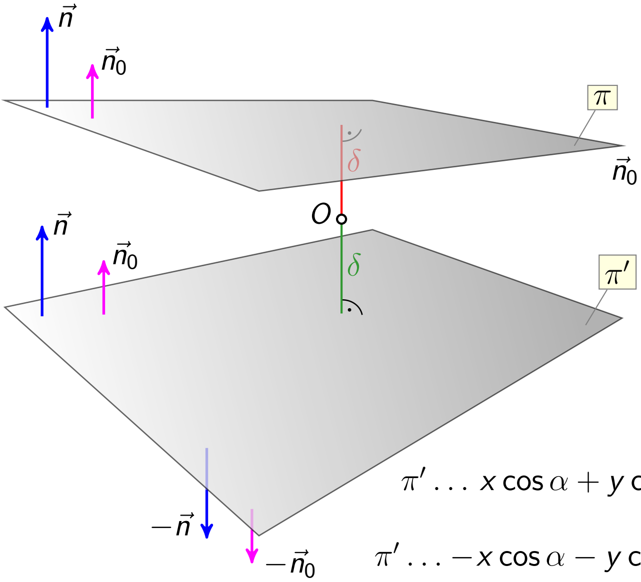
normalni oblik



$$\vec{n}_0 = (\cos\alpha, \cos\beta, \cos\gamma)$$

nije normalni oblik

$$\pi' \ldots x\cos\alpha + y\cos\beta + z\cos\gamma + \delta = 0$$

$$\pi' \ldots -x\cos\alpha - y\cos\beta - z\cos\gamma - \delta = 0$$

normalni oblik

2. način

2. način $\vec{n} = (8, 9, 1)$

2. način $\vec{n} = (8, 9, 1), \ \ T_0(0, 0, 0)$

2. način $\vec{n} = (8, 9, 1), \; T_0(0, 0, 0), \; d(T_0, \pi) = 1$

$\boxed{\text{2. način}}$ $\vec{n} = (8, 9, 1),\ \ T_0(0, 0, 0),\ \ d(T_0, \pi) = 1$

$\pi \ldots\ Ax + By + Cz + D = 0$

$\boxed{\text{2. način}}$ $\vec{n} = (\overset{A}{8}, \overset{B}{9}, \overset{C}{1}),\ T_0(0,0,0),\ d(T_0, \pi) = 1$

$\pi \ldots Ax + By + Cz + D = 0$

2. način $\vec{n} = (\overset{A}{8}, \overset{B}{9}, \overset{C}{1}), \;\; T_0(0,0,0), \;\; d(T_0, \pi) = 1$

$$\pi \ldots \; Ax + By + Cz + D = 0$$

$$d(T_0, \pi) = \frac{|Ax_0 + By_0 + Cz_0 + D|}{\sqrt{A^2 + B^2 + C^2}}$$

2. način $\vec{n} = (\overset{A}{8}, \overset{B}{9}, \overset{C}{1}),\ T_0(\overset{x_0}{0}, \overset{y_0}{0}, \overset{z_0}{0}),\ d(T_0, \pi) = 1$

$\pi \ldots\ Ax + By + Cz + D = 0$

$$d(T_0, \pi) = \frac{|Ax_0 + By_0 + Cz_0 + D|}{\sqrt{A^2 + B^2 + C^2}}$$

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$\pi \ldots Ax + By + Cz + D = 0$

$$d(T_0, \pi) = \frac{|Ax_0 + By_0 + Cz_0 + D|}{\sqrt{A^2 + B^2 + C^2}}$$

$1 =$

2. način $\quad \vec{n} = (\overset{A}{8}, \overset{B}{9}, \overset{C}{1}), \; T_0(\overset{x_0}{0}, \overset{y_0}{0}, \overset{z_0}{0}), \; d(T_0, \pi) = 1$

$$\pi \ldots \; Ax + By + Cz + D = 0$$

$$d(T_0, \pi) = \frac{|Ax_0 + By_0 + Cz_0 + D|}{\sqrt{A^2 + B^2 + C^2}}$$

$$1 = \frac{\qquad}{\qquad}$$

2. način $\quad \vec{n} = (\overset{A}{8}, \overset{B}{9}, \overset{C}{1}), \ T_0(\overset{x_0}{0}, \overset{y_0}{0}, \overset{z_0}{0}), \ d(T_0, \pi) = 1$

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$$1 = \frac{|}{}$$

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$$\pi \ldots \; Ax + By + Cz + D = 0$$

$$d(T_0, \pi) = \frac{|Ax_0 + By_0 + Cz_0 + D|}{\sqrt{A^2 + B^2 + C^2}}$$

$$1 = \frac{|8 \cdot \qquad\qquad}{\qquad\qquad}$$

2. način $\underset{}{\vec{n}} = (\overset{A}{8}, \overset{B}{9}, \overset{C}{1}), \ T_0(\overset{x_0}{0}, \overset{y_0}{0}, \overset{z_0}{0}), \ d(T_0, \pi) = 1$

$$\pi \ldots \ Ax + By + Cz + D = 0$$

$$d(T_0, \pi) = \frac{|Ax_0 + By_0 + Cz_0 + D|}{\sqrt{A^2 + B^2 + C^2}}$$

$$1 = \frac{|8 \cdot 0}{\phantom{\sqrt{A^2 + B^2 + C^2 + D^2}}}$$

2. način $\vec{n} = (\overset{A}{8}, \overset{B}{9}, \overset{C}{1}), \; T_0(\overset{x_0}{0}, \overset{y_0}{0}, \overset{z_0}{0}), \; d(T_0, \pi) = 1$

$$\pi \ldots \; Ax + By + Cz + D = 0$$

$$d(T_0, \pi) = \frac{|Ax_0 + By_0 + Cz_0 + D|}{\sqrt{A^2 + B^2 + C^2}}$$

$$1 = \frac{|8 \cdot 0 +}{\phantom{\sqrt{A^2 + B^2 + C^2 + D^2}}}$$

2. način $\quad \vec{n} = (\overset{A}{8}, \overset{B}{9}, \overset{C}{1}),\ \ T_0(\overset{x_0}{0}, \overset{y_0}{0}, \overset{z_0}{0}),\ \ d(T_0, \pi) = 1$

$$\pi \ldots\ Ax + By + Cz + D = 0$$

$$d(T_0, \pi) = \frac{|Ax_0 + By_0 + Cz_0 + D|}{\sqrt{A^2 + B^2 + C^2}}$$

$$1 = \frac{|8 \cdot 0 + 9 \cdot \qquad\qquad\qquad}{\qquad}$$

2. način $\quad \vec{n} = (\overset{A}{8}, \overset{B}{9}, \overset{C}{1}), \; T_0(\overset{x_0}{0}, \overset{y_0}{0}, \overset{z_0}{0}), \; d(T_0, \pi) = 1$

$$\pi \ldots \; Ax + By + Cz + D = 0$$

$$d(T_0, \pi) = \frac{|Ax_0 + By_0 + Cz_0 + D|}{\sqrt{A^2 + B^2 + C^2}}$$

$$1 = \frac{|8 \cdot 0 + 9 \cdot 0}{}$$

2. način $\overset{}{\vec{n}} = (\overset{A}{8}, \overset{B}{9}, \overset{C}{1}),\ T_0(\overset{x_0}{0}, \overset{y_0}{0}, \overset{z_0}{0}),\ d(T_0, \pi) = 1$

$$\pi \ldots Ax + By + Cz + D = 0$$

$$d(T_0, \pi) = \frac{|Ax_0 + By_0 + Cz_0 + D|}{\sqrt{A^2 + B^2 + C^2}}$$

$$1 = \frac{|8 \cdot 0 + 9 \cdot 0 +}{}$$

2. način $\overset{}{\vec{n}} = (\overset{A}{8}, \overset{B}{9}, \overset{C}{1}), \;\; T_0(\overset{x_0}{0}, \overset{y_0}{0}, \overset{z_0}{0}), \;\; d(T_0, \pi) = 1$

$$\pi \ldots \; Ax + By + Cz + D = 0$$

$$d(T_0, \pi) = \frac{|Ax_0 + By_0 + Cz_0 + D|}{\sqrt{A^2 + B^2 + C^2}}$$

$$1 = \frac{|8 \cdot 0 + 9 \cdot 0 + 1 \cdot}{}$$

2. način $\overset{}{\vec{n}} = (\overset{A}{8}, \overset{B}{9}, \overset{C}{1}),\ T_0(\overset{x_0}{0}, \overset{y_0}{0}, \overset{z_0}{0}),\ d(T_0, \pi) = 1$

$$\pi \ldots \ Ax + By + Cz + D = 0$$

$$d(T_0, \pi) = \frac{|Ax_0 + By_0 + Cz_0 + D|}{\sqrt{A^2 + B^2 + C^2}}$$

$$1 = \frac{|8 \cdot 0 + 9 \cdot 0 + 1 \cdot 0}{}$$

2. način $\quad \vec{n} = (\overset{A}{8}, \overset{B}{9}, \overset{C}{1}),\ \ T_0(\overset{x_0}{0}, \overset{y_0}{0}, \overset{z_0}{0}),\ \ d(T_0, \pi) = 1$

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$$d(T_0, \pi) = \frac{|Ax_0 + By_0 + Cz_0 + D|}{\sqrt{A^2 + B^2 + C^2}}$$

$$1 = \frac{|8 \cdot 0 + 9 \cdot 0 + 1 \cdot 0 + D|}{}$$

2. način $\quad \vec{n} = (\overset{A}{8}, \overset{B}{9}, \overset{C}{1}), \;\; T_0(\overset{x_0}{0}, \overset{y_0}{0}, \overset{z_0}{0}), \;\; d(T_0, \pi) = 1$

$$\pi \ldots \; Ax + By + Cz + D = 0$$

$$d(T_0, \pi) = \frac{|Ax_0 + By_0 + Cz_0 + D|}{\sqrt{A^2 + B^2 + C^2}}$$

$$1 = \frac{|8 \cdot 0 + 9 \cdot 0 + 1 \cdot 0 + D|}{\sqrt{}}$$

2. način $\quad \vec{n} = (\overset{A}{8}, \overset{B}{9}, \overset{C}{1}), \;\; T_0(\overset{x_0}{0}, \overset{y_0}{0}, \overset{z_0}{0}), \;\; d(T_0, \pi) = 1$

$$\pi \ldots \; Ax + By + Cz + D = 0$$

$$d(T_0, \pi) = \frac{|Ax_0 + By_0 + Cz_0 + D|}{\sqrt{A^2 + B^2 + C^2}}$$

$$1 = \frac{|8 \cdot 0 + 9 \cdot 0 + 1 \cdot 0 + D|}{\sqrt{8^2 \qquad\qquad\qquad}}$$

2. način $\quad \vec{n} = (\overset{A}{8}, \overset{B}{9}, \overset{C}{1}), \quad T_0(\overset{x_0}{0}, \overset{y_0}{0}, \overset{z_0}{0}), \quad d(T_0, \pi) = 1$

$$\pi \dots Ax + By + Cz + D = 0$$

$$d(T_0, \pi) = \frac{|Ax_0 + By_0 + Cz_0 + D|}{\sqrt{A^2 + B^2 + C^2}}$$

$$1 = \frac{|8 \cdot 0 + 9 \cdot 0 + 1 \cdot 0 + D|}{\sqrt{8^2 + 9^2 }}$$

2. način $\quad \vec{n} = (\overset{A}{8}, \overset{B}{9}, \overset{C}{1}),\ \ T_0(\overset{x_0}{0}, \overset{y_0}{0}, \overset{z_0}{0}),\ \ d(T_0, \pi) = 1$

$$\pi \ldots \ Ax + By + Cz + D = 0$$

$$d(T_0, \pi) = \frac{|Ax_0 + By_0 + Cz_0 + D|}{\sqrt{A^2 + B^2 + C^2}}$$

$$1 = \frac{|8 \cdot 0 + 9 \cdot 0 + 1 \cdot 0 + D|}{\sqrt{8^2 + 9^2 + 1^2}}$$

2. način $\quad \overset{}{\vec{n}} = (\overset{A}{8}, \overset{B}{9}, \overset{C}{1}), \quad T_0(\overset{x_0}{0}, \overset{y_0}{0}, \overset{z_0}{0}), \quad d(T_0, \pi) = 1$

$$\pi \ldots \; Ax + By + Cz + D = 0$$

$$d(T_0, \pi) = \frac{|Ax_0 + By_0 + Cz_0 + D|}{\sqrt{A^2 + B^2 + C^2}}$$

$$1 = \frac{|8 \cdot 0 + 9 \cdot 0 + 1 \cdot 0 + D|}{\sqrt{8^2 + 9^2 + 1^2}}$$

$$1 = \frac{|D|}{\sqrt{146}}$$

2. način $\quad \vec{n} = (\overset{A}{8}, \overset{B}{9}, \overset{C}{1}), \;\; T_0(\overset{x_0}{0}, \overset{y_0}{0}, \overset{z_0}{0}), \;\; d(T_0, \pi) = 1$

$$\pi \ldots \; Ax + By + Cz + D = 0$$

$$d(T_0, \pi) = \frac{|Ax_0 + By_0 + Cz_0 + D|}{\sqrt{A^2 + B^2 + C^2}}$$

$$1 = \frac{|8 \cdot 0 + 9 \cdot 0 + 1 \cdot 0 + D|}{\sqrt{8^2 + 9^2 + 1^2}}$$

$$1 = \frac{|D|}{\sqrt{146}} \rightsquigarrow |D| = \sqrt{146}$$

2. način $\quad \vec{n} = (\overset{A}{8}, \overset{B}{9}, \overset{C}{1}),\ T_0(\overset{x_0}{0}, \overset{y_0}{0}, \overset{z_0}{0}),\ d(T_0, \pi) = 1$

$$\pi \ldots Ax + By + Cz + D = 0$$

$$d(T_0, \pi) = \frac{|Ax_0 + By_0 + Cz_0 + D|}{\sqrt{A^2 + B^2 + C^2}}$$

$$1 = \frac{|8 \cdot 0 + 9 \cdot 0 + 1 \cdot 0 + D|}{\sqrt{8^2 + 9^2 + 1^2}}$$

$$1 = \frac{|D|}{\sqrt{146}} \rightsquigarrow |D| = \sqrt{146} \rightsquigarrow D = \pm\sqrt{146}$$

2. način $\quad \overset{\color{blue}{A\ B\ C}}{\vec{n} = (8, 9, 1)}, \ \ T_0(\overset{\color{blue}{x_0\ y_0\ z_0}}{0, 0, 0}), \ \ d(T_0, \pi) = 1$

$$\pi \dots Ax + By + Cz + D = 0$$

negativni predznak poštuje orijentaciju normale $\vec{n}$

$$d(T_0, \pi) = \frac{|Ax_0 + By_0 + Cz_0 + D|}{\sqrt{A^2 + B^2 + C^2}}$$

$$1 = \frac{|8 \cdot 0 + 9 \cdot 0 + 1 \cdot 0 + D|}{\sqrt{8^2 + 9^2 + 1^2}}$$

$$1 = \frac{|D|}{\sqrt{146}} \rightsquigarrow |D| = \sqrt{146} \rightsquigarrow D = \pm\sqrt{146}$$

2. način $\quad \vec{n} = (\overset{A}{8}, \overset{B}{9}, \overset{C}{1}), \;\; T_0(\overset{x_0}{0}, \overset{y_0}{0}, \overset{z_0}{0}), \;\; d(T_0, \pi) = 1$

$$\pi \ldots Ax + By + Cz + D = 0$$

negativni predznak poštuje orijentaciju normale $\vec{n}$

pozitivni predznak ne poštuje orijentaciju normale $\vec{n}$

$$d(T_0, \pi) = \frac{|Ax_0 + By_0 + Cz_0 + D|}{\sqrt{A^2 + B^2 + C^2}}$$

$$1 = \frac{|8 \cdot 0 + 9 \cdot 0 + 1 \cdot 0 + D|}{\sqrt{8^2 + 9^2 + 1^2}}$$

$$1 = \frac{|D|}{\sqrt{146}} \rightsquigarrow |D| = \sqrt{146} \rightsquigarrow D = \pm\sqrt{146}$$

2. način $\quad \overset{}{\vec{n}} = (\overset{A}{8}, \overset{B}{9}, \overset{C}{1}),\ \ T_0(\overset{x_0}{0}, \overset{y_0}{0}, \overset{z_0}{0}),\ \ d(T_0, \pi) = 1$

$$\pi \ldots\ Ax + By + Cz + D = 0$$

$\pi \ldots$

negativni predznak poštuje orijentaciju normale $\vec{n}$

$$d(T_0, \pi) = \frac{|Ax_0 + By_0 + Cz_0 + D|}{\sqrt{A^2 + B^2 + C^2}}$$

pozitivni predznak ne poštuje orijentaciju normale $\vec{n}$

$$1 = \frac{|8 \cdot 0 + 9 \cdot 0 + 1 \cdot 0 + D|}{\sqrt{8^2 + 9^2 + 1^2}}$$

$$1 = \frac{|D|}{\sqrt{146}} \rightsquigarrow |D| = \sqrt{146} \rightsquigarrow D = \pm\sqrt{146}$$

2. način $\quad \vec{n} = (\overset{A}{8}, \overset{B}{9}, \overset{C}{1}),\ \ T_0(\overset{x_0}{0}, \overset{y_0}{0}, \overset{z_0}{0}),\ \ d(T_0, \pi) = 1$

$$\pi \ldots Ax + By + Cz + D = 0$$

$$\pi \ldots 8x + 9y + z - \sqrt{146} = 0$$

negativni predznak poštuje orijentaciju normale $\vec{n}$

$$d(T_0, \pi) = \frac{|Ax_0 + By_0 + Cz_0 + D|}{\sqrt{A^2 + B^2 + C^2}}$$

pozitivni predznak ne poštuje orijentaciju normale $\vec{n}$

$$1 = \frac{|8 \cdot 0 + 9 \cdot 0 + 1 \cdot 0 + D|}{\sqrt{8^2 + 9^2 + 1^2}}$$

$$1 = \frac{|D|}{\sqrt{146}} \rightsquigarrow |D| = \sqrt{146} \rightsquigarrow D = \pm\sqrt{146}$$

2. način $\quad \vec{n} = (\overset{A}{8}, \overset{B}{9}, \overset{C}{1}),\ \ T_0(\overset{x_0}{0}, \overset{y_0}{0}, \overset{z_0}{0}),\ \ d(T_0, \pi) = 1$

$$\pi \ldots Ax + By + Cz + D = 0$$

$$\boxed{\pi \ldots 8x + 9y + z - \sqrt{146} = 0}$$

negativni predznak poštuje orijentaciju normale $\vec{n}$

$$d(T_0, \pi) = \frac{|Ax_0 + By_0 + Cz_0 + D|}{\sqrt{A^2 + B^2 + C^2}}$$

pozitivni predznak ne poštuje orijentaciju normale $\vec{n}$

$$1 = \frac{|8 \cdot 0 + 9 \cdot 0 + 1 \cdot 0 + D|}{\sqrt{8^2 + 9^2 + 1^2}}$$

$$1 = \frac{|D|}{\sqrt{146}} \rightsquigarrow |D| = \sqrt{146} \rightsquigarrow D = \pm\sqrt{146}$$

2. način $\vec{n} = (\overset{A}{8}, \overset{B}{9}, \overset{C}{1}),\ T_0(\overset{x_0}{0}, \overset{y_0}{0}, \overset{z_0}{0}),\ d(T_0, \pi) = 1$

$$\pi \ldots Ax + By + Cz + D = 0$$

$$\boxed{\pi \ldots 8x + 9y + z - \sqrt{146} = 0}$$

negativni predznak poštuje orijentaciju normale $\vec{n}$

$$d(T_0, \pi) = \frac{|Ax_0 + By_0 + Cz_0 + D|}{\sqrt{A^2 + B^2 + C^2}}$$

pozitivni predznak ne poštuje orijentaciju normale $\vec{n}$

$$1 = \frac{|8 \cdot 0 + 9 \cdot 0 + 1 \cdot 0 + D|}{\sqrt{8^2 + 9^2 + 1^2}}$$

$$1 = \frac{|D|}{\sqrt{146}} \rightsquigarrow |D| = \sqrt{146} \rightsquigarrow D = \pm\sqrt{146}$$

$$\pi' \ldots 8x + 9y + z + \sqrt{146} = 0$$

treći zadatak

Zadatak 3

Ispitajte jesu li točke $A(1, 2, 3)$ *i* $B(4, 0, -5)$ *s iste strane ravnine*

$$\Sigma \ldots\ 2x - y + 5z - 1 = 0.$$

Odredite točku S *u kojoj pravac* AB *siječe ravninu* Σ*. Pripada li točka* S *dužini* $\overline{AB}$*? Obrazložite svoj odgovor.*

Zadatak 3

Ispitajte jesu li točke $A(1, 2, 3)$ *i* $B(4, 0, -5)$ *s iste strane ravnine*

$$\Sigma \ldots \ 2x - y + 5z - 1 = 0.$$

Odredite točku S *u kojoj pravac* AB *siječe ravninu* Σ*. Pripada li točka* S *dužini* $\overline{AB}$*? Obrazložite svoj odgovor.*

Rješenje

$A(1, 2, 3)$

Zadatak 3

Ispitajte jesu li točke $A(1,2,3)$ *i* $B(4,0,-5)$ *s iste strane ravnine*

$$\Sigma \ldots\ 2x - y + 5z - 1 = 0.$$

Odredite točku S *u kojoj pravac* AB *siječe ravninu* Σ*. Pripada li točka* S *dužini* $\overline{AB}$*? Obrazložite svoj odgovor.*

Rješenje

$$A(\overset{x}{1}, \overset{y}{2}, \overset{z}{3}) \rightsquigarrow 2x - y + 5z - 1 =$$

Zadatak 3

Ispitajte jesu li točke $A(1,2,3)$ *i* $B(4,0,-5)$ *s iste strane ravnine*

$$\Sigma \ldots\ 2x - y + 5z - 1 = 0.$$

Odredite točku S *u kojoj pravac* AB *siječe ravninu* Σ*. Pripada li točka* S *dužini* $\overline{AB}$*? Obrazložite svoj odgovor.*

Rješenje

$$A(\overset{x}{1},\overset{y}{2},\overset{z}{3}) \rightsquigarrow 2x - y + 5z - 1 = 2 \cdot 1$$

Zadatak 3

Ispitajte jesu li točke $A(1,2,3)$ i $B(4,0,-5)$ s iste strane ravnine

$$\Sigma \ldots\ 2x - y + 5z - 1 = 0.$$

Odredite točku S u kojoj pravac AB siječe ravninu Σ. Pripada li točka S dužini $\overline{AB}$? Obrazložite svoj odgovor.

Rješenje

$$A(\overset{x}{1},\overset{y}{2},\overset{z}{3}) \rightsquigarrow 2x - y + 5z - 1 = 2 \cdot 1 - 2$$

Zadatak 3

Ispitajte jesu li točke $A(1,2,3)$ *i* $B(4,0,-5)$ *s iste strane ravnine*

$$\Sigma \ldots\ 2x - y + 5z - 1 = 0.$$

Odredite točku S *u kojoj pravac* AB *siječe ravninu* Σ*. Pripada li točka* S *dužini* $\overline{AB}$*? Obrazložite svoj odgovor.*

Rješenje

$$A(\overset{x}{1},\overset{y}{2},\overset{z}{3}) \rightsquigarrow 2x - y + 5z - 1 = 2\cdot 1 - 2 + 5\cdot 3$$

Zadatak 3

Ispitajte jesu li točke $A(1,2,3)$ *i* $B(4,0,-5)$ *s iste strane ravnine*

$$\Sigma \ldots \; 2x - y + 5z - 1 = 0.$$

Odredite točku S *u kojoj pravac* AB *siječe ravninu* Σ*. Pripada li točka* S *dužini* $\overline{AB}$*? Obrazložite svoj odgovor.*

Rješenje

$$A(\overset{x}{1},\overset{y}{2},\overset{z}{3}) \rightsquigarrow 2x - y + 5z - 1 = 2\cdot 1 - 2 + 5\cdot 3 - 1$$

Zadatak 3

Ispitajte jesu li točke $A(1,2,3)$ *i* $B(4,0,-5)$ *s iste strane ravnine*

$$\Sigma \ldots \; 2x - y + 5z - 1 = 0.$$

Odredite točku S *u kojoj pravac* AB *siječe ravninu* Σ*. Pripada li točka* S *dužini* $\overline{AB}$*? Obrazložite svoj odgovor.*

Rješenje

$$A(\overset{x}{1},\overset{y}{2},\overset{z}{3}) \rightsquigarrow 2x - y + 5z - 1 = 2 \cdot 1 - 2 + 5 \cdot 3 - 1 = 14$$

Zadatak 3

Ispitajte jesu li točke $A(1,2,3)$ *i* $B(4,0,-5)$ *s iste strane ravnine*

$$\Sigma \ldots\ 2x - y + 5z - 1 = 0.$$

Odredite točku S *u kojoj pravac* AB *siječe ravninu* Σ*. Pripada li točka* S *dužini* $\overline{AB}$*? Obrazložite svoj odgovor.*

Rješenje

$$A(\overset{x}{1},\overset{y}{2},\overset{z}{3}) \rightsquigarrow 2x - y + 5z - 1 = 2\cdot 1 - 2 + 5\cdot 3 - 1 = 14 > 0$$

Zadatak 3

Ispitajte jesu li točke $A(1,2,3)$ i $B(4,0,-5)$ s iste strane ravnine

$$\Sigma \ldots\ 2x - y + 5z - 1 = 0.$$

Odredite točku S u kojoj pravac AB siječe ravninu Σ. Pripada li točka S dužini $\overline{AB}$? Obrazložite svoj odgovor.

Rješenje

$$A(\overset{x}{1},\overset{y}{2},\overset{z}{3}) \rightsquigarrow 2x - y + 5z - 1 = 2 \cdot 1 - 2 + 5 \cdot 3 - 1 = 14 > 0$$

$B(4,0,-5)$

Zadatak 3

Ispitajte jesu li točke $A(1,2,3)$ *i* $B(4,0,-5)$ *s iste strane ravnine*

$$\Sigma \ldots \; 2x - y + 5z - 1 = 0.$$

Odredite točku S *u kojoj pravac* AB *siječe ravninu* Σ*. Pripada li točka* S *dužini* $\overline{AB}$*? Obrazložite svoj odgovor.*

Rješenje

$$\overset{x}{A(1},\overset{y}{2},\overset{z}{3}) \rightsquigarrow 2x - y + 5z - 1 = 2\cdot 1 - 2 + 5\cdot 3 - 1 = 14 > 0$$

$$\overset{x}{B(4},\overset{y}{0},\overset{z}{-5}) \rightsquigarrow 2x - y + 5z - 1 =$$

Zadatak 3

Ispitajte jesu li točke $A(1,2,3)$ *i* $B(4,0,-5)$ *s iste strane ravnine*

$$\Sigma \ldots\ 2x - y + 5z - 1 = 0.$$

Odredite točku S *u kojoj pravac* AB *siječe ravninu* Σ. *Pripada li točka* S *dužini* $\overline{AB}$? *Obrazložite svoj odgovor.*

Rješenje

$$A(\overset{x}{1}, \overset{y}{2}, \overset{z}{3}) \rightsquigarrow 2x - y + 5z - 1 = 2 \cdot 1 - 2 + 5 \cdot 3 - 1 = 14 > 0$$

$$B(\overset{x}{4}, \overset{y}{0}, \overset{z}{-5}) \rightsquigarrow 2x - y + 5z - 1 = 2 \cdot 4$$

Zadatak 3

Ispitajte jesu li točke $A(1,2,3)$ *i* $B(4,0,-5)$ *s iste strane ravnine*

$$\Sigma \ldots\ 2x - y + 5z - 1 = 0.$$

Odredite točku S *u kojoj pravac* AB *siječe ravninu* Σ*. Pripada li točka* S *dužini* $\overline{AB}$*? Obrazložite svoj odgovor.*

Rješenje

$$A(\overset{x}{1},\overset{y}{2},\overset{z}{3}) \rightsquigarrow 2x - y + 5z - 1 = 2\cdot 1 - 2 + 5\cdot 3 - 1 = 14 > 0$$

$$B(\overset{x}{4},\overset{y}{0},\overset{z}{-5}) \rightsquigarrow 2x - y + 5z - 1 = 2\cdot 4 - 0$$

Zadatak 3

Ispitajte jesu li točke $A(1,2,3)$ *i* $B(4,0,-5)$ *s iste strane ravnine*

$$\Sigma \ldots\ 2x - y + 5z - 1 = 0.$$

Odredite točku S *u kojoj pravac* AB *siječe ravninu* Σ*. Pripada li točka* S *dužini* $\overline{AB}$*? Obrazložite svoj odgovor.*

Rješenje

$$\overset{x}{A(1},\overset{y}{2},\overset{z}{3)} \rightsquigarrow 2x - y + 5z - 1 = 2 \cdot 1 - 2 + 5 \cdot 3 - 1 = 14 > 0$$

$$\overset{x}{B(4},\overset{y}{0},\overset{z}{-5)} \rightsquigarrow 2x - y + 5z - 1 = 2 \cdot 4 - 0 + 5 \cdot (-5)$$

Zadatak 3

Ispitajte jesu li točke $A(1,2,3)$ i $B(4,0,-5)$ s iste strane ravnine

$$\Sigma \ldots\ 2x - y + 5z - 1 = 0.$$

Odredite točku S u kojoj pravac AB siječe ravninu Σ. Pripada li točka S dužini $\overline{AB}$? Obrazložite svoj odgovor.

Rješenje

$$A(\overset{x}{1},\overset{y}{2},\overset{z}{3}) \rightsquigarrow 2x - y + 5z - 1 = 2\cdot 1 - 2 + 5\cdot 3 - 1 = 14 > 0$$

$$B(\overset{x}{4},\overset{y}{0},\overset{z}{-5}) \rightsquigarrow 2x - y + 5z - 1 = 2\cdot 4 - 0 + 5\cdot(-5) - 1$$

Zadatak 3

Ispitajte jesu li točke $A(1,2,3)$ *i* $B(4,0,-5)$ *s iste strane ravnine*

$$\Sigma \ldots\ 2x - y + 5z - 1 = 0.$$

Odredite točku S *u kojoj pravac* AB *siječe ravninu* Σ*. Pripada li točka* S *dužini* $\overline{AB}$*? Obrazložite svoj odgovor.*

Rješenje

$$A(\overset{x}{1}, \overset{y}{2}, \overset{z}{3}) \rightsquigarrow 2x - y + 5z - 1 = 2 \cdot 1 - 2 + 5 \cdot 3 - 1 = 14 > 0$$

$$B(\overset{x}{4}, \overset{y}{0}, \overset{z}{-5}) \rightsquigarrow 2x - y + 5z - 1 = 2 \cdot 4 - 0 + 5 \cdot (-5) - 1 = -18$$

Zadatak 3

Ispitajte jesu li točke $A(1,2,3)$ *i* $B(4,0,-5)$ *s iste strane ravnine*

$$\Sigma \ldots\ 2x - y + 5z - 1 = 0.$$

Odredite točku S *u kojoj pravac* AB *siječe ravninu* Σ*. Pripada li točka* S *dužini* $\overline{AB}$*? Obrazložite svoj odgovor.*

Rješenje

$$A(\overset{x}{1},\overset{y}{2},\overset{z}{3}) \rightsquigarrow 2x - y + 5z - 1 = 2\cdot 1 - 2 + 5\cdot 3 - 1 = 14 > 0$$

$$B(\overset{x}{4},\overset{y}{0},\overset{z}{-5}) \rightsquigarrow 2x - y + 5z - 1 = 2\cdot 4 - 0 + 5\cdot(-5) - 1 = -18 < 0$$

Zadatak 3

Ispitajte jesu li točke $A(1,2,3)$ *i* $B(4,0,-5)$ *s iste strane ravnine*

$$\Sigma \ldots\ 2x - y + 5z - 1 = 0.$$

Odredite točku S *u kojoj pravac* AB *siječe ravninu* Σ*. Pripada li točka* S *dužini* $\overline{AB}$*? Obrazložite svoj odgovor.*

Rješenje

$$A(\overset{x}{1},\overset{y}{2},\overset{z}{3}) \rightsquigarrow 2x - y + 5z - 1 = 2\cdot 1 - 2 + 5\cdot 3 - 1 = 14 > 0$$

$$B(\overset{x}{4},\overset{y}{0},\overset{z}{-5}) \rightsquigarrow 2x - y + 5z - 1 = 2\cdot 4 - 0 + 5\cdot(-5) - 1 = -18 < 0$$

Točke A i B se nalaze s različitih strana ravnine Σ.

Zadatak 3

Ispitajte jesu li točke $A(1,2,3)$ *i* $B(4,0,-5)$ *s iste strane ravnine*

$$\Sigma \ldots\ 2x - y + 5z - 1 = 0.$$

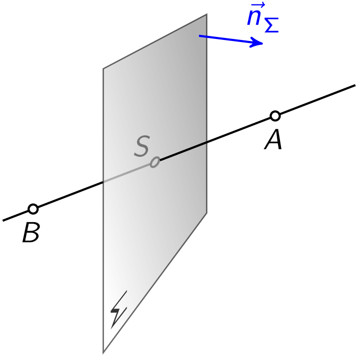
Odredite točku S *u kojoj pravac* AB *siječe ravninu* Σ*. Pripada li točka* S *dužini* $\overline{AB}$*? Obrazložite svoj odgovor.*

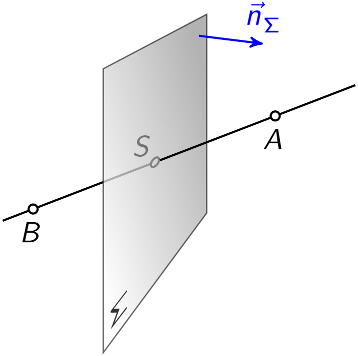
Rješenje

$$A(\overset{x}{1},\overset{y}{2},\overset{z}{3}) \rightsquigarrow 2x - y + 5z - 1 = 2 \cdot 1 - 2 + 5 \cdot 3 - 1 = 14 > 0$$

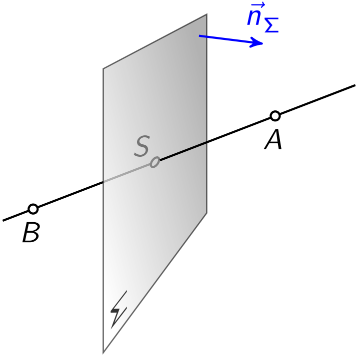
$$B(\overset{x}{4},\overset{y}{0},\overset{z}{-5}) \rightsquigarrow 2x - y + 5z - 1 = 2 \cdot 4 - 0 + 5 \cdot (-5) - 1 = -18 < 0$$

Točke A i B se nalaze s različitih strana ravnine Σ. Točka A se nalazi na onoj strani na koju pokazuje normala $\vec{n}_\Sigma = (2,-1,5)$.


$\vec{n}_\Sigma$
S
A
B

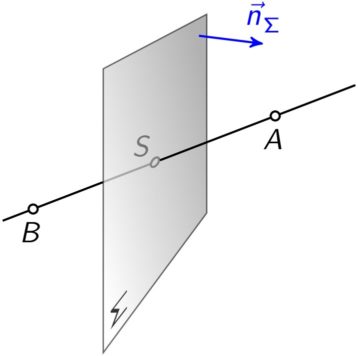


$A(1, 2, 3),\ \ B(4, 0, -5)$



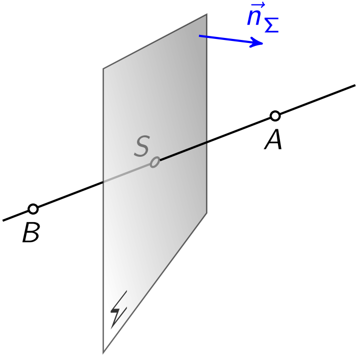
$$A(1,2,3),\ \ B(4,0,-5)$$

$AB\ldots$



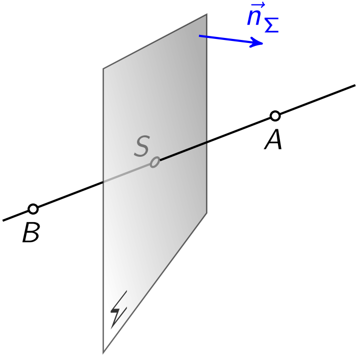
$$A(1,2,3),\ \ B(4,0,-5)$$

$$AB \ldots\ A,\ \overrightarrow{AB}$$



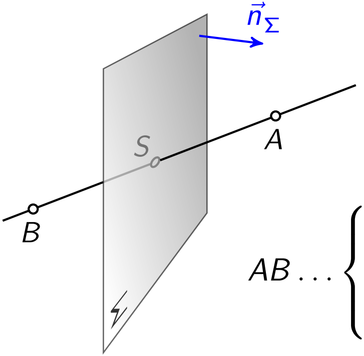
$$A(1,2,3),\ \ B(4,0,-5)$$

$$AB \ldots\ A,\ \overrightarrow{AB} \qquad \overrightarrow{AB} =$$



$$A(1,2,3),\ \ B(4,0,-5)$$

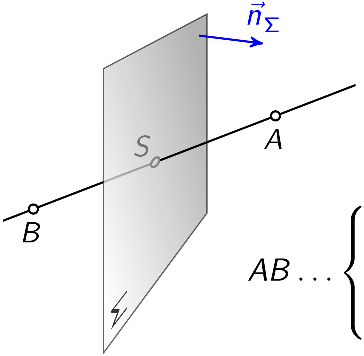
$$AB \ldots\ A,\ \overrightarrow{AB} \qquad \overrightarrow{AB} = (3,-2,-8)$$



$A(1, 2, 3)$, $B(4, 0, -5)$

$AB \ldots A, \overrightarrow{AB}$ $\qquad \overrightarrow{AB} = (3, -2, -8)$

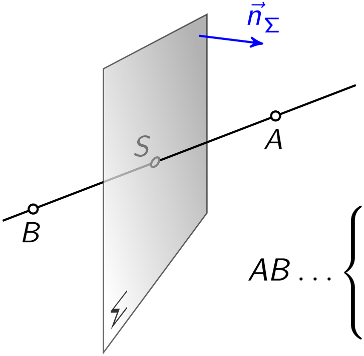
$AB \ldots \left\{ \right.$



$$A(1,2,3),\ \ B(4,0,-5)$$

$$AB\dots\ A,\ \overrightarrow{AB} \qquad \overrightarrow{AB} = (3,-2,-8)$$

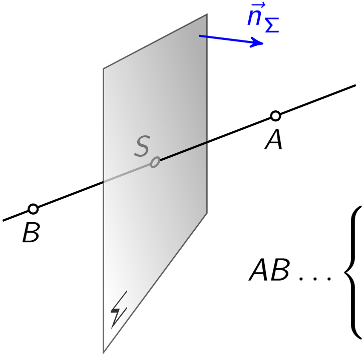
$$AB\dots \begin{cases} x = \\ y = \\ z = \end{cases}$$



$$A(1,2,3),\ \ B(4,0,-5)$$

$$AB \ldots\ A,\ \overrightarrow{AB} \qquad \overrightarrow{AB} = (3,-2,-8)$$

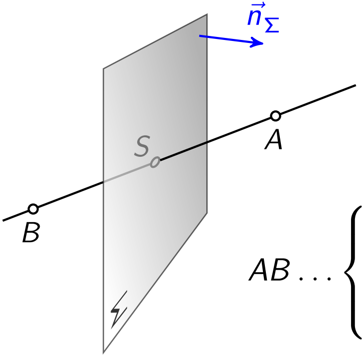
$$AB \ldots \begin{cases} x = 1 \\ y = 2 \\ z = 3 \end{cases}$$



$$A(1,2,3),\ \ B(4,0,-5)$$

$$AB \ldots\ A,\ \overrightarrow{AB} \qquad \overrightarrow{AB} = (3,-2,-8)$$

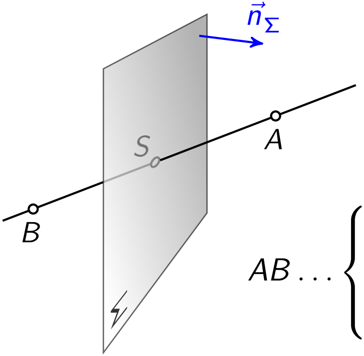
$$AB \ldots \begin{cases} x = 1 + \\ y = 2 + \\ z = 3 + \end{cases}$$



$A(1,2,3),\ B(4,0,-5)$

$AB \ldots\ A,\ \overrightarrow{AB} \qquad \overrightarrow{AB} = (3,-2,-8)$

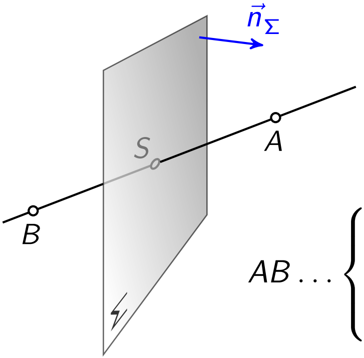
$$AB \ldots \begin{cases} x = 1 + 3 \\ y = 2 + (-2) \\ z = 3 + (-8) \end{cases}$$



$$A(1,2,3),\ \ B(4,0,-5)$$

$$AB \ldots\ A,\ \overrightarrow{AB} \qquad \overrightarrow{AB} = (3,-2,-8)$$

$$AB \ldots \begin{cases} x = 1 + 3 \cdot t \\ y = 2 + (-2) \cdot t \\ z = 3 + (-8) \cdot t \end{cases}$$



$$A(1,2,3),\ \ B(4,0,-5)$$

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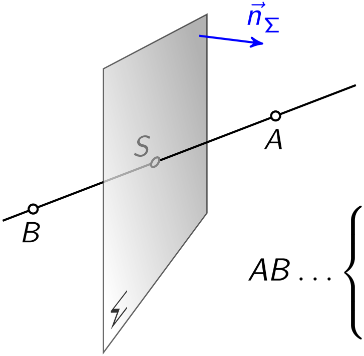
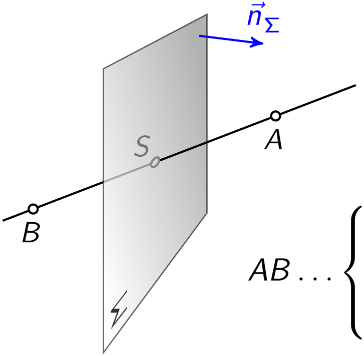


$$A(1,2,3),\ \ B(4,0,-5)$$

$$AB \ldots\ A,\ \overrightarrow{AB} \qquad \overrightarrow{AB} = (3,-2,-8)$$

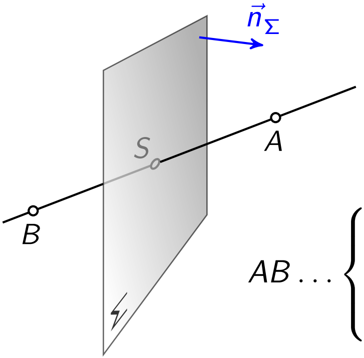
$$AB \ldots \begin{cases} x = 1 + 3\cdot t \\ y = 2 + (-2)\cdot t \\ z = 3 + (-8)\cdot t \end{cases} \qquad AB \ldots \begin{cases} x = 1 + 3t \\ \\ \\ \end{cases}$$



$A(1,2,3),\ B(4,0,-5)$

$AB \ldots A, \overrightarrow{AB}$ $\quad$ $\overrightarrow{AB} = (3,-2,-8)$

$$AB \ldots \begin{cases} x = 1 + 3\cdot t \\ y = 2 + (-2)\cdot t \\ z = 3 + (-8)\cdot t \end{cases} \qquad AB \ldots \begin{cases} x = 1 + 3t \\ y = 2 - 2t \\ \end{cases}$$



$A(1,2,3),\ B(4,0,-5)$

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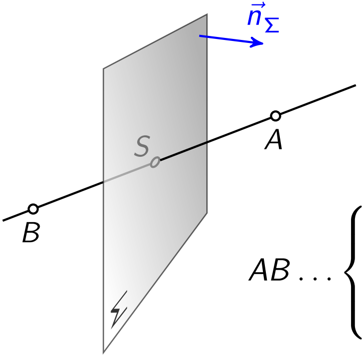
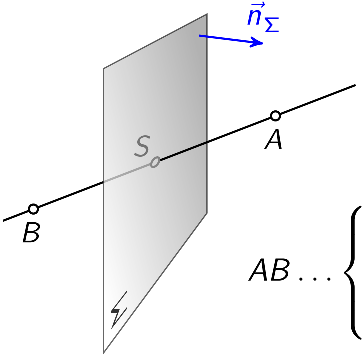


$$A(1,2,3),\ \ B(4,0,-5)$$

$$AB \ldots\ A,\ \overrightarrow{AB} \qquad \overrightarrow{AB} = (3,-2,-8)$$

$$\Sigma \ldots\ 2x - y + 5z - 1 = 0$$

$$AB \ldots \begin{cases} x = 1 + 3 \cdot t \\ y = 2 + (-2) \cdot t \\ z = 3 + (-8) \cdot t \end{cases} \qquad AB \ldots \begin{cases} x = 1 + 3t \\ y = 2 - 2t \\ z = 3 - 8t \end{cases}$$



$$A(1,2,3),\ B(4,0,-5)$$

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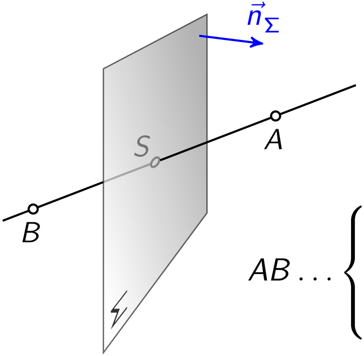


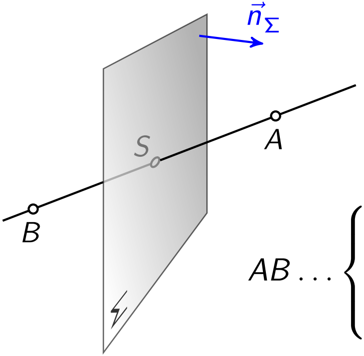
$$A(1,2,3),\ \ B(4,0,-5)$$

$$AB\ldots\ A,\ \overrightarrow{AB} \qquad \overrightarrow{AB}=(3,-2,-8)$$

$$\Sigma\ldots\ 2x-y+5z-1=0$$

$$AB\ldots\begin{cases} x=1+3\cdot t\\ y=2+(-2)\cdot t\\ z=3+(-8)\cdot t\end{cases} \qquad AB\ldots\begin{cases} \boxed{x=1+3t}\\ \boxed{y=2-2t}\\ \boxed{z=3-8t}\end{cases}$$

$$2x-y+5z-1=0$$



$$A(1,2,3),\ \ B(4,0,-5)$$

$$AB \dots A,\ \overrightarrow{AB} \qquad \overrightarrow{AB} = (3,-2,-8)$$

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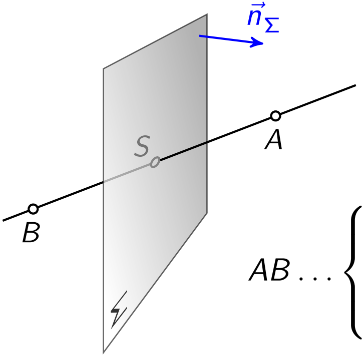
$$AB \dots \begin{cases} x = 1 + 3 \cdot t \\ y = 2 + (-2) \cdot t \\ z = 3 + (-8) \cdot t \end{cases} \qquad AB \dots \begin{cases} \boxed{x = 1 + 3t \\ y = 2 - 2t \\ z = 3 - 8t} \end{cases}$$

$$2x - y + 5z - 1 = 0$$

$$2 \cdot (1 + 3t)$$



$$A(1,2,3),\ \ B(4,0,-5)$$

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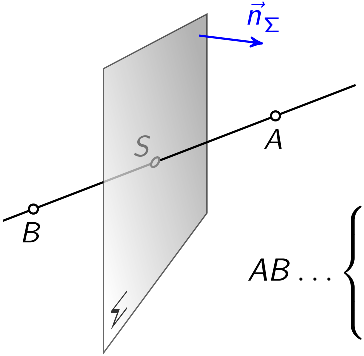
$$2x - y + 5z - 1 = 0$$

$$2\cdot(1+3t) - (2-2t)$$



$$A(1,2,3),\ \ B(4,0,-5)$$

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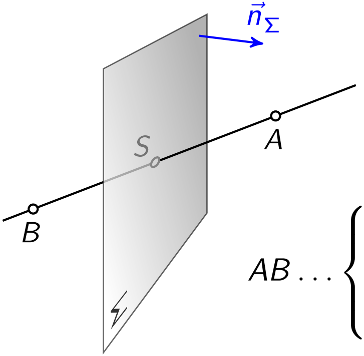
$$2x - y + 5z - 1 = 0$$

$$2 \cdot (1 + 3t) - (2 - 2t) + 5 \cdot (3 - 8t)$$



$$A(1,2,3),\ \ B(4,0,-5)$$

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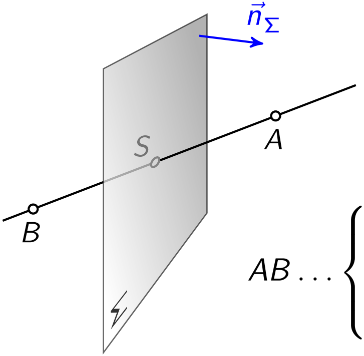
$$2x - y + 5z - 1 = 0$$

$$2\cdot(1+3t) - (2-2t) + 5\cdot(3-8t) - 1$$



$$A(1,2,3),\ \ B(4,0,-5)$$

$$AB \ldots\ A,\ \overrightarrow{AB} \qquad \overrightarrow{AB} = (3,-2,-8)$$

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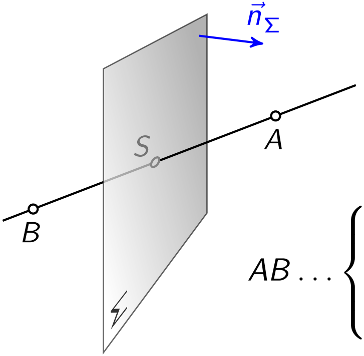
$$2x - y + 5z - 1 = 0$$

$$2 \cdot (1 + 3t) - (2 - 2t) + 5 \cdot (3 - 8t) - 1 = 0$$



$$A(1,2,3),\ \ B(4,0,-5)$$

$$AB\ldots\ A,\ \overrightarrow{AB} \qquad \overrightarrow{AB}=(3,-2,-8)$$

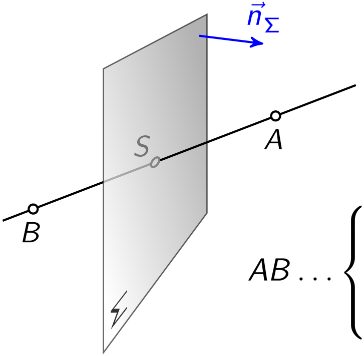
$$\Sigma\ldots\ 2x-y+5z-1=0$$

$$AB\ldots\begin{cases} x=1+3\cdot t\\ y=2+(-2)\cdot t\\ z=3+(-8)\cdot t\end{cases} \qquad AB\ldots\begin{cases} \boxed{x=1+3t}\\ \boxed{y=2-2t}\\ \boxed{z=3-8t}\end{cases}$$

$$2x-y+5z-1=0$$

$$2\cdot(1+3t)-(2-2t)+5\cdot(3-8t)-1=0$$

$$2+6t$$



$$A(1,2,3),\ \ B(4,0,-5)$$

$$AB \dots\ A,\ \overrightarrow{AB} \qquad \overrightarrow{AB} = (3,-2,-8)$$

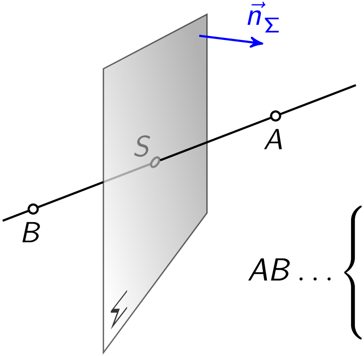
$$\Sigma \dots\ 2x - y + 5z - 1 = 0$$

$$AB \dots \begin{cases} x = 1 + 3 \cdot t \\ y = 2 + (-2) \cdot t \\ z = 3 + (-8) \cdot t \end{cases} \qquad AB \dots \begin{cases} \boxed{\begin{aligned} x &= 1 + 3t \\ y &= 2 - 2t \\ z &= 3 - 8t \end{aligned}} \end{cases}$$

$$2x - y + 5z - 1 = 0$$

$$2 \cdot (1 + 3t) - (2 - 2t) + 5 \cdot (3 - 8t) - 1 = 0$$

$$2 + 6t - 2 + 2t$$



$$A(1,2,3),\ \ B(4,0,-5)$$

$$AB \ldots\ A,\ \overrightarrow{AB} \qquad \overrightarrow{AB} = (3,-2,-8)$$

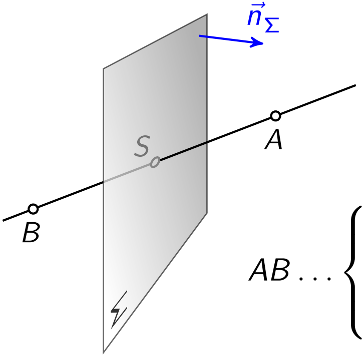
$$\Sigma \ldots\ 2x - y + 5z - 1 = 0$$

$$AB \ldots \begin{cases} x = 1 + 3\cdot t \\ y = 2 + (-2)\cdot t \\ z = 3 + (-8)\cdot t \end{cases} \qquad AB \ldots \begin{cases} \boxed{\begin{aligned} x &= 1 + 3t \\ y &= 2 - 2t \\ z &= 3 - 8t \end{aligned}} \end{cases}$$

$$2x - y + 5z - 1 = 0$$

$$2\cdot(1+3t) - (2-2t) + 5\cdot(3-8t) - 1 = 0$$

$$2 + 6t - 2 + 2t + 15 - 40t$$



$$A(1,2,3),\ \ B(4,0,-5)$$

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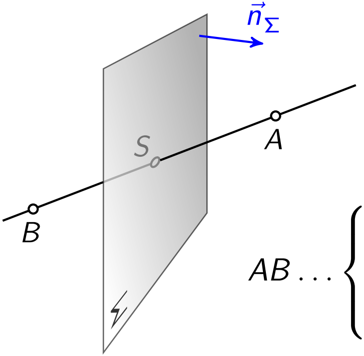
$$AB \ldots \begin{cases} x = 1 + 3\cdot t \\ y = 2 + (-2)\cdot t \\ z = 3 + (-8)\cdot t \end{cases} \qquad AB \ldots \begin{cases} x = 1 + 3t \\ y = 2 - 2t \\ z = 3 - 8t \end{cases}$$

$$2x - y + 5z - 1 = 0$$

$$2\cdot(1+3t) - (2-2t) + 5\cdot(3-8t) - 1 = 0$$

$$2 + 6t - 2 + 2t + 15 - 40t - 1$$



$$A(1,2,3),\ \ B(4,0,-5)$$

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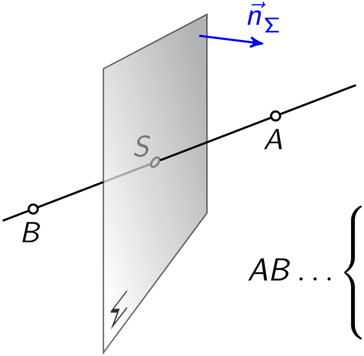
$$2x - y + 5z - 1 = 0$$

$$2 \cdot (1 + 3t) - (2 - 2t) + 5 \cdot (3 - 8t) - 1 = 0$$

$$2 + 6t - 2 + 2t + 15 - 40t - 1 = 0$$



$$A(1,2,3),\ \ B(4,0,-5)$$

$$AB \ldots\ A,\ \overrightarrow{AB} \qquad \overrightarrow{AB} = (3,-2,-8)$$

$$\Sigma \ldots\ 2x - y + 5z - 1 = 0$$

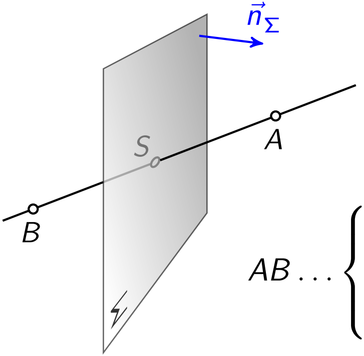
$$AB \ldots \begin{cases} x = 1 + 3\cdot t \\ y = 2 + (-2)\cdot t \\ z = 3 + (-8)\cdot t \end{cases} \qquad AB \ldots \boxed{\begin{cases} x = 1 + 3t \\ y = 2 - 2t \\ z = 3 - 8t \end{cases}}$$

$$2x - y + 5z - 1 = 0$$

$$2\cdot(1+3t) - (2-2t) + 5\cdot(3-8t) - 1 = 0$$

$$2 + 6t - 2 + 2t + 15 - 40t - 1 = 0$$

$$-32t + 14 = 0$$



$$A(1,2,3),\;\; B(4,0,-5)$$

$$AB\ldots\ A,\ \overrightarrow{AB} \qquad \overrightarrow{AB}=(3,-2,-8)$$

$$\Sigma\ldots\ 2x-y+5z-1=0$$

$$AB\ldots\begin{cases} x=1+3\cdot t\\ y=2+(-2)\cdot t\\ z=3+(-8)\cdot t\end{cases} \qquad AB\ldots\begin{cases} \boxed{x=1+3t}\\ \boxed{y=2-2t}\\ \boxed{z=3-8t}\end{cases}$$

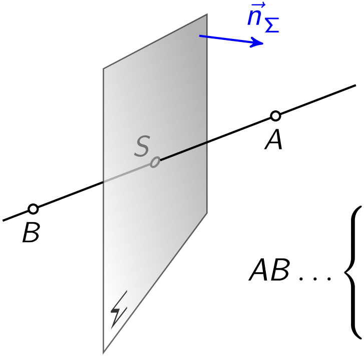
$$2x-y+5z-1=0$$

$$2\cdot(1+3t)-(2-2t)+5\cdot(3-8t)-1=0$$

$$2+6t-2+2t+15-40t-1=0$$

$$-32t+14=0$$

$$t=\frac{7}{16}$$



$$A(1,2,3),\ \ B(4,0,-5)$$

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$$\Sigma \dots\ 2x - y + 5z - 1 = 0$$

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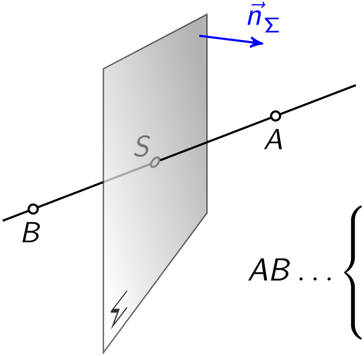
$$-32t + 14 = 0$$

$$\boxed{t = \frac{7}{16}}$$



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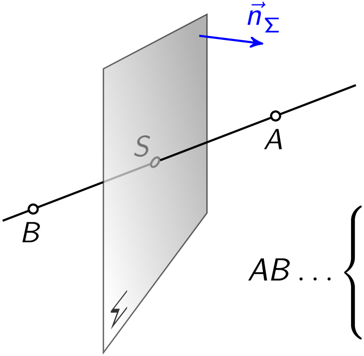

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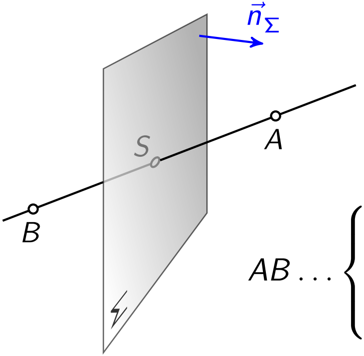

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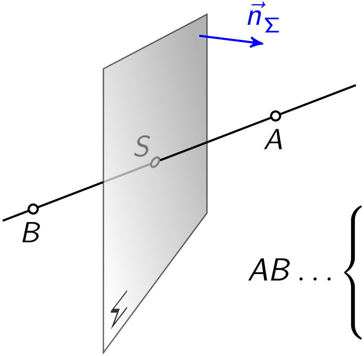

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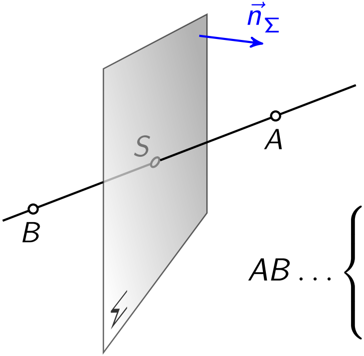

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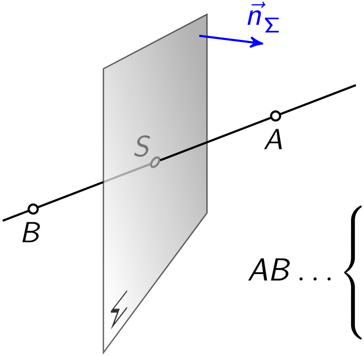

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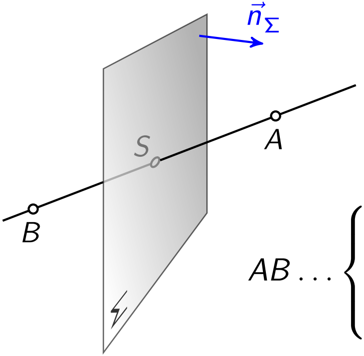

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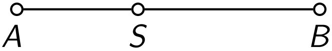
Točka S pripada dužini $\overline{AB}$ jer se točke A i B nalaze s različitih strana ravnine Σ.

2. način *pomoću djelišnog omjera*



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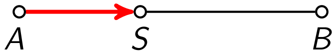

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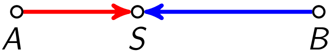
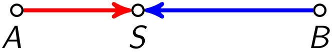


2. način *pomoću djelišnog omjera* $A(1, 2, 3),\ B(4, 0, -5)$



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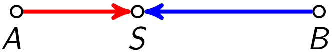

$S\left(\frac{37}{16}, \frac{9}{8}, -\frac{1}{2}\right)$

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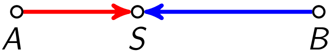

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$$\boxed{\overrightarrow{AS} = \lambda\overrightarrow{BS}}$$

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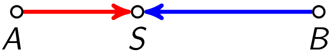

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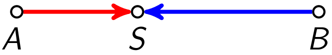

$$\overrightarrow{AS}=\left(\frac{21}{16},-\frac{7}{8},-\frac{7}{2}\right)$$

$$\boxed{\overrightarrow{AS}=\lambda\overrightarrow{BS}}$$

2. način *pomoću djelišnog omjera*

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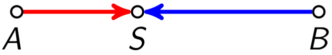

$$\boxed{\overrightarrow{AS} = \lambda \overrightarrow{BS}}$$

$$\overrightarrow{AS} = \left(\frac{21}{16},\ -\frac{7}{8},\ -\frac{7}{2}\right) \qquad \overrightarrow{BS} =$$

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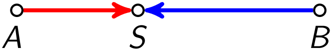

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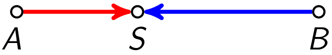

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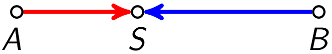

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$$\boxed{\overrightarrow{AS} = \lambda \overrightarrow{BS}}$$

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$$\frac{21}{16}$$

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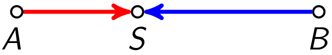

$S\left(\frac{37}{16},\ \frac{9}{8},\ -\frac{1}{2}\right)$

$\overrightarrow{AS}=\left(\frac{21}{16},\ -\frac{7}{8},\ -\frac{7}{2}\right)$ $\overrightarrow{BS}=\left(-\frac{27}{16},\ \frac{9}{8},\ \frac{9}{2}\right)$

$$\boxed{\overrightarrow{AS}=\lambda\overrightarrow{BS}}$$

$$\frac{\frac{21}{16}}{-\frac{27}{16}}$$

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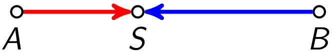

$S\left(\frac{37}{16}, \frac{9}{8}, -\frac{1}{2}\right)$

$\boxed{\overrightarrow{AS} = \lambda \overrightarrow{BS}}$

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$$\frac{\frac{21}{16}}{-\frac{27}{16}} = \underline{\qquad}$$

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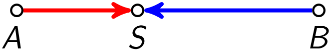

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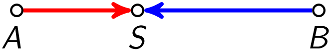

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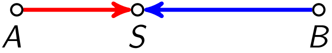

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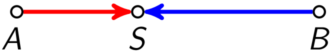

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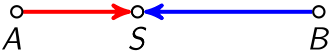

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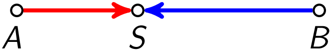

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$$\frac{\frac{21}{16}}{-\frac{27}{16}} = \frac{-\frac{7}{8}}{\frac{9}{8}} = \frac{-\frac{7}{2}}{\frac{9}{2}} \quad \rightsquigarrow$$

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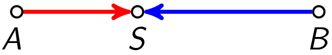

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$$\frac{\frac{21}{16}}{-\frac{27}{16}} = \frac{-\frac{7}{8}}{\frac{9}{8}} = \frac{-\frac{7}{2}}{\frac{9}{2}} \rightsquigarrow -\frac{7}{9}$$

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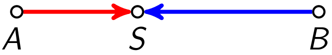


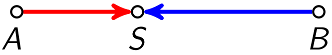
$$\boxed{\overrightarrow{AS} = \lambda \overrightarrow{BS}}$$

$$\overrightarrow{AS} = \left(\frac{21}{16}, -\frac{7}{8}, -\frac{7}{2}\right) \qquad \overrightarrow{BS} = \left(-\frac{27}{16}, \frac{9}{8}, \frac{9}{2}\right)$$

$$\frac{\frac{21}{16}}{-\frac{27}{16}} = \frac{-\frac{7}{8}}{\frac{9}{8}} = \frac{-\frac{7}{2}}{\frac{9}{2}} \rightsquigarrow -\frac{7}{9} = -\frac{7}{9}$$

2. način *pomoću djelišnog omjera*

$A(1, 2, 3),\ B(4, 0, -5)$



$S\left(\frac{37}{16}, \frac{9}{8}, -\frac{1}{2}\right)$

$$\overrightarrow{AS} = \left(\frac{21}{16}, -\frac{7}{8}, -\frac{7}{2}\right) \qquad \overrightarrow{BS} = \left(-\frac{27}{16}, \frac{9}{8}, \frac{9}{2}\right)$$

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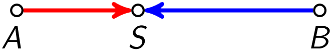
2. način *pomoću djelišnog omjera* $A(1,2,3),\ B(4,0,-5)$

$S\left(\frac{37}{16}, \frac{9}{8}, -\frac{1}{2}\right)$



$\overrightarrow{AS} = \left(\frac{21}{16}, -\frac{7}{8}, -\frac{7}{2}\right)$ $\overrightarrow{BS} = \left(-\frac{27}{16}, \frac{9}{8}, \frac{9}{2}\right)$

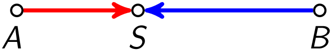
$$\boxed{\overrightarrow{AS} = \lambda \overrightarrow{BS}}$$

$$\frac{\frac{21}{16}}{-\frac{27}{16}} = \frac{-\frac{7}{8}}{\frac{9}{8}} = \frac{-\frac{7}{2}}{\frac{9}{2}} \rightsquigarrow -\frac{7}{9} = -\frac{7}{9} = -\frac{7}{9} \rightsquigarrow$$

točke A, B i S su kolinearne

2. način *pomoću djelišnog omjera* $A(1,2,3),\ B(4,0,-5)$

$$S\left(\frac{37}{16}, \frac{9}{8}, -\frac{1}{2}\right)$$



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točke A, B i S su kolinearne

$$\lambda = -\frac{7}{9}$$

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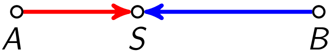

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točke A, B i S su kolinearne

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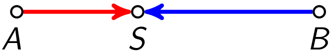

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$\overrightarrow{AS} = \left(\frac{21}{16}, -\frac{7}{8}, -\frac{7}{2}\right) \qquad \overrightarrow{BS} = \left(-\frac{27}{16}, \frac{9}{8}, \frac{9}{2}\right)$

$\boxed{\overrightarrow{AS} = \lambda \overrightarrow{BS}}$

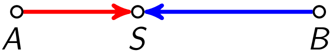
$$\frac{\frac{21}{16}}{-\frac{27}{16}} = \frac{-\frac{7}{8}}{\frac{9}{8}} = \frac{-\frac{7}{2}}{\frac{9}{2}} \rightsquigarrow -\frac{7}{9} = -\frac{7}{9} = -\frac{7}{9} \rightsquigarrow \text{točke } A, B \text{ i } S \text{ su kolinearne}$$

Kako je $\lambda < 0$, točka S pripada dužini $\overline{AB}$.

$\boxed{\lambda = -\frac{7}{9}}$

2. način *pomoću djelišnog omjera*

$A(1,2,3),\ B(4,0,-5)$



$S\left(\frac{37}{16}, \frac{9}{8}, -\frac{1}{2}\right)$

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$$\frac{\frac{21}{16}}{-\frac{27}{16}} = \frac{-\frac{7}{8}}{\frac{9}{8}} = \frac{-\frac{7}{2}}{\frac{9}{2}} \rightsquigarrow -\frac{7}{9} = -\frac{7}{9} = -\frac{7}{9} \rightsquigarrow$$ točke A, B i S su kolinearne

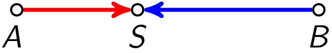
Kako je $\lambda < 0$, točka S pripada dužini $\overline{AB}$.

$\boxed{\lambda = -\frac{7}{9}}$

3. način *još jedna ideja*

2. način *pomoću djelišnog omjera*

$A(1,2,3),\ \ B(4,0,-5)$



$$S\left(\frac{37}{16},\ \frac{9}{8},\ -\frac{1}{2}\right)$$

$$\overrightarrow{AS}=\left(\frac{21}{16},\ -\frac{7}{8},\ -\frac{7}{2}\right) \qquad \overrightarrow{BS}=\left(-\frac{27}{16},\ \frac{9}{8},\ \frac{9}{2}\right)$$

$$\overrightarrow{AS}=\lambda\overrightarrow{BS}$$

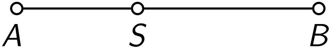
$$\frac{\frac{21}{16}}{-\frac{27}{16}}=\frac{-\frac{7}{8}}{\frac{9}{8}}=\frac{-\frac{7}{2}}{\frac{9}{2}} \rightsquigarrow -\frac{7}{9}=-\frac{7}{9}=-\frac{7}{9} \rightsquigarrow$$

točke A, B i S su kolinearne

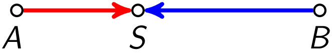
Kako je $\lambda<0$, točka S pripada dužini $\overline{AB}$.

$$\boxed{\lambda=-\frac{7}{9}}$$

3. način *još jedna ideja*



2. način *pomoću djelišnog omjera* $A(1,2,3),\ B(4,0,-5)$



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$\overrightarrow{AS} = \left(\frac{21}{16}, -\frac{7}{8}, -\frac{7}{2}\right)$ $\overrightarrow{BS} = \left(-\frac{27}{16}, \frac{9}{8}, \frac{9}{2}\right)$ $\overrightarrow{AS} = \lambda\overrightarrow{BS}$

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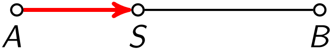
točke A, B i S su kolinearne

Kako je $\lambda < 0$, točka S pripada dužini $\overline{AB}$.

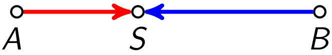
$\boxed{\lambda = -\frac{7}{9}}$

3. način *još jedna ideja*



2. način *pomoću djelišnog omjera*

$A(1, 2, 3),\ \ B(4, 0, -5)$



$$S\left(\frac{37}{16}, \frac{9}{8}, -\frac{1}{2}\right)$$

$$\overrightarrow{AS} = \left(\frac{21}{16}, -\frac{7}{8}, -\frac{7}{2}\right) \qquad \overrightarrow{BS} = \left(-\frac{27}{16}, \frac{9}{8}, \frac{9}{2}\right)$$

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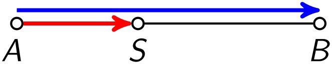

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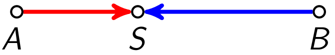


$S\left(\frac{37}{16}, \frac{9}{8}, -\frac{1}{2}\right)$

$$\overrightarrow{AS} = \left(\frac{21}{16}, -\frac{7}{8}, -\frac{7}{2}\right) \qquad \overrightarrow{BS} = \left(-\frac{27}{16}, \frac{9}{8}, \frac{9}{2}\right)$$

$\overrightarrow{AS} = \lambda \overrightarrow{BS}$

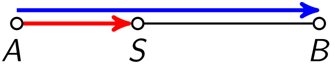
$$\frac{\frac{21}{16}}{-\frac{27}{16}} = \frac{-\frac{7}{8}}{\frac{9}{8}} = \frac{-\frac{7}{2}}{\frac{9}{2}} \rightsquigarrow -\frac{7}{9} = -\frac{7}{9} = -\frac{7}{9} \rightsquigarrow$$ točke A, B i S su kolinearne

$\boxed{\lambda = -\frac{7}{9}}$

Kako je $\lambda < 0$, točka S pripada dužini $\overline{AB}$.

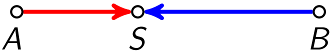
3. način *još jedna ideja*

$$\overrightarrow{AS} = \mu \overrightarrow{AB}$$



2. način *pomoću djelišnog omjera*

$A(1,2,3),\ B(4,0,-5)$



$S\left(\frac{37}{16}, \frac{9}{8}, -\frac{1}{2}\right)$

$\overrightarrow{AS} = \left(\frac{21}{16}, -\frac{7}{8}, -\frac{7}{2}\right) \qquad \overrightarrow{BS} = \left(-\frac{27}{16}, \frac{9}{8}, \frac{9}{2}\right)$

$\overrightarrow{AS} = \lambda \overrightarrow{BS}$

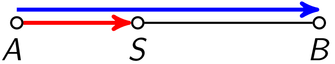
$$\frac{\frac{21}{16}}{-\frac{27}{16}} = \frac{-\frac{7}{8}}{\frac{9}{8}} = \frac{-\frac{7}{2}}{\frac{9}{2}} \rightsquigarrow -\frac{7}{9} = -\frac{7}{9} = -\frac{7}{9} \rightsquigarrow$$

točke A, B i S su kolinearne

Kako je $\lambda < 0$, točka S pripada dužini $\overline{AB}$.

$\boxed{\lambda = -\frac{7}{9}}$

3. način *još jedna ideja*



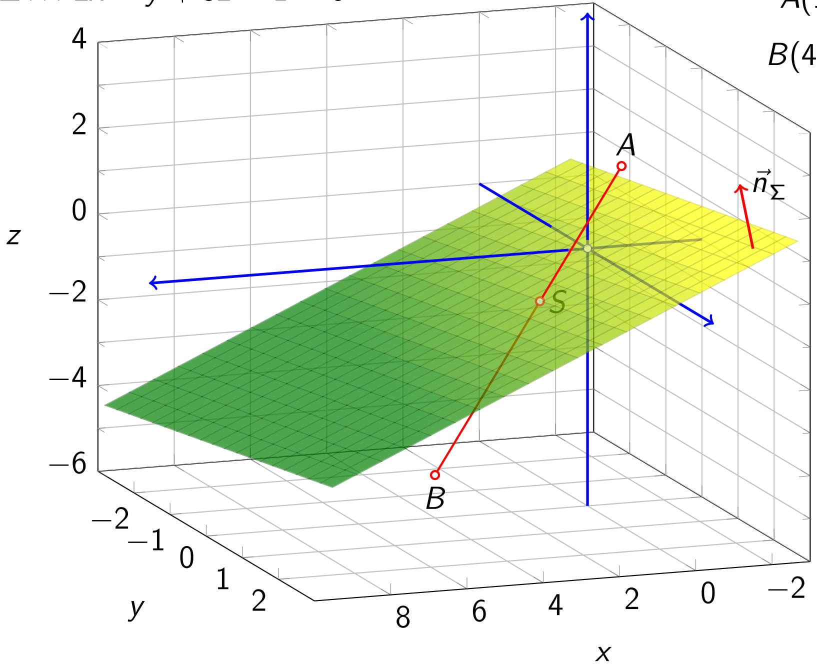
$\overrightarrow{AS} = \mu \overrightarrow{AB}$

$S \in \overline{AB} \Leftrightarrow \mu \in [0,1]$

$\Sigma \ldots\ 2x - y + 5z - 1 = 0$

$A(1, 2, 3)$

$B(4, 0, -5)$

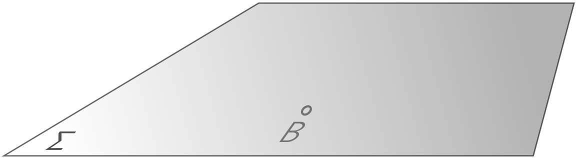


četvrti zadatak

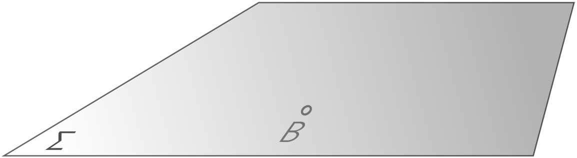
Zadatak 4

Napišite jednadžbu ravnine koja prolazi točkom $B(-1, 2, -4)$*, a okomita je na ravnine* $x + 3y - 2z + 5 = 0$ *i* $-4x + 5y - z + 3 = 0$.

Rješenje



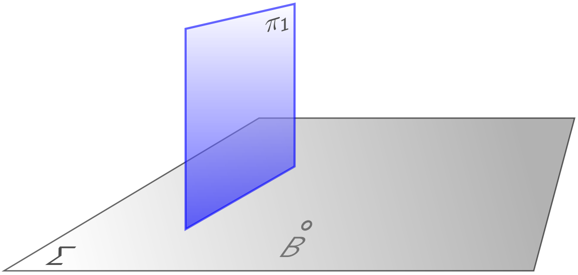
Rješenje



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

Rješenje

$\pi_1 \ldots x + 3y - 2z + 5 = 0$



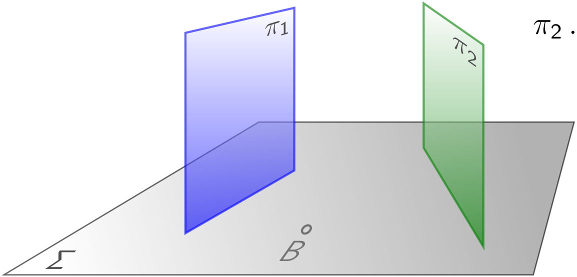
$B(-1, 2, -4)$

$\Sigma \perp \pi_1$

Rješenje

$\pi_1 \ldots\ x + 3y - 2z + 5 = 0$

$\pi_2 \ldots\ -4x + 5y - z + 3 = 0$

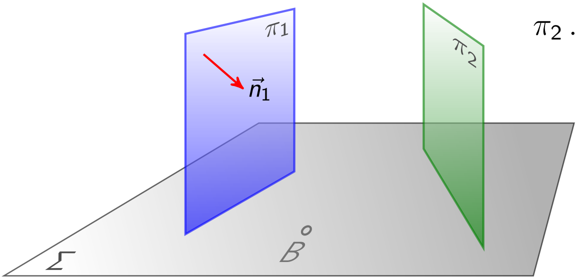


$B(-1, 2, -4)$

$\Sigma \perp \pi_1$

$\Sigma \perp \pi_2$

Rješenje



$\pi_1 \ldots \; x + 3y - 2z + 5 = 0$

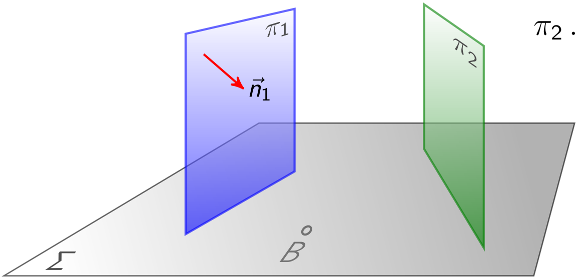
$\pi_2 \ldots \; -4x + 5y - z + 3 = 0$

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

$\Sigma \perp \pi_1$

$\Sigma \perp \pi_2$

Rješenje



$\pi_1 \ldots x + 3y - 2z + 5 = 0$

$\pi_2 \ldots -4x + 5y - z + 3 = 0$

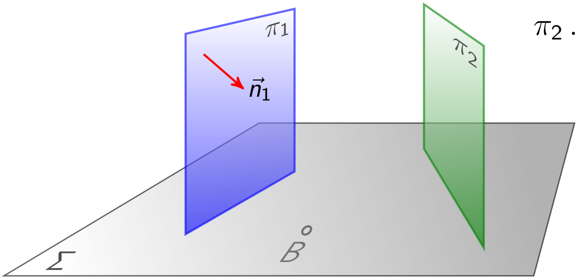
$B(-1, 2, -4)$

$\vec{n}_1 =$

$\Sigma \perp \pi_1$

$\Sigma \perp \pi_2$

Rješenje



$\pi_1 \ldots \; x + 3y - 2z + 5 = 0$

$\pi_2 \ldots -4x + 5y - z + 3 = 0$

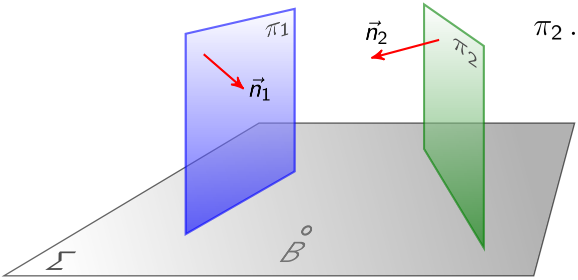
$B(-1, 2, -4)$

$\vec{n}_1 = (1, 3, -2)$

$\Sigma \perp \pi_1$

$\Sigma \perp \pi_2$

Rješenje



$\pi_1 \ldots \; x + 3y - 2z + 5 = 0$

$\pi_2 \ldots \; -4x + 5y - z + 3 = 0$

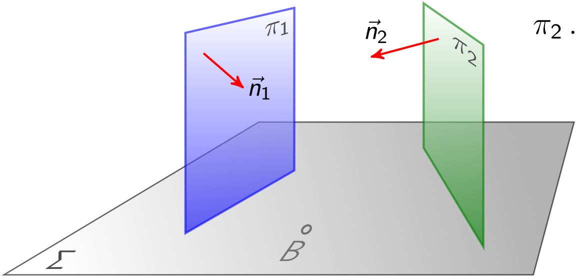
$B(-1, 2, -4)$

$\vec{n}_1 = (1, 3, -2)$

$\Sigma \perp \pi_1$

$\Sigma \perp \pi_2$

Rješenje



$\pi_1 \ldots \; x + 3y - 2z + 5 = 0$

$\pi_2 \ldots \; -4x + 5y - z + 3 = 0$

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

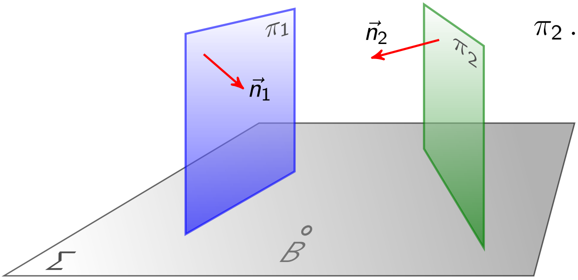
$\vec{n}_1 = (1, 3, -2)$

$\vec{n}_2 =$

$\Sigma \perp \pi_1$

$\Sigma \perp \pi_2$

Rješenje



$\pi_1 \ldots\ x + 3y - 2z + 5 = 0$

$\pi_2 \ldots\ -4x + 5y - z + 3 = 0$

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

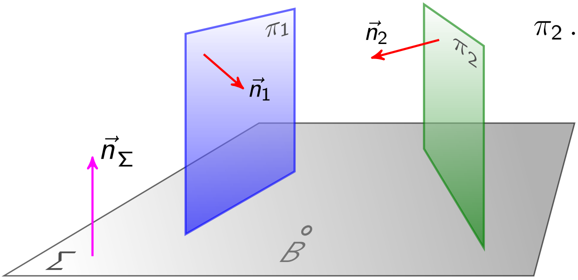
$\vec{n}_1 = (1, 3, -2)$

$\vec{n}_2 = (-4, 5, -1)$

$\Sigma \perp \pi_1$

$\Sigma \perp \pi_2$

Rješenje



$\pi_1 \ldots\; x + 3y - 2z + 5 = 0$

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

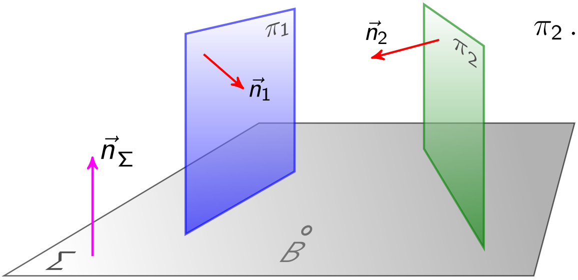
$\vec{n}_1 = (1, 3, -2)$

$\vec{n}_2 = (-4, 5, -1)$

$\Sigma \perp \pi_1$

$\Sigma \perp \pi_2$

Rješenje



$$\pi_1 \ldots \; x + 3y - 2z + 5 = 0$$

$$\pi_2 \ldots \; -4x + 5y - z + 3 = 0$$

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

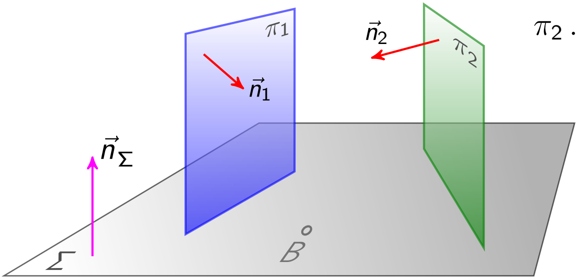
$$\vec{n}_1 = (1, 3, -2)$$

$$\vec{n}_2 = (-4, 5, -1)$$

$$\Sigma \perp \pi_1 \;\Rightarrow\; \vec{n}_\Sigma \perp \vec{n}_1$$

$$\Sigma \perp \pi_2$$

Rješenje



$\pi_1 \ldots\ x + 3y - 2z + 5 = 0$

$\pi_2 \ldots\ -4x + 5y - z + 3 = 0$

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

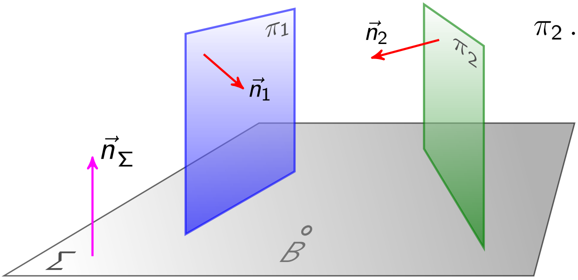
$\vec{n}_1 = (1, 3, -2)$

$\vec{n}_2 = (-4, 5, -1)$

$\Sigma \perp \pi_1 \ \Rightarrow\ \vec{n}_\Sigma \perp \vec{n}_1$

$\Sigma \perp \pi_2 \ \Rightarrow\ \vec{n}_\Sigma \perp \vec{n}_2$

Rješenje



$\pi_1 \ldots\ x + 3y - 2z + 5 = 0$

$\pi_2 \ldots\ -4x + 5y - z + 3 = 0$

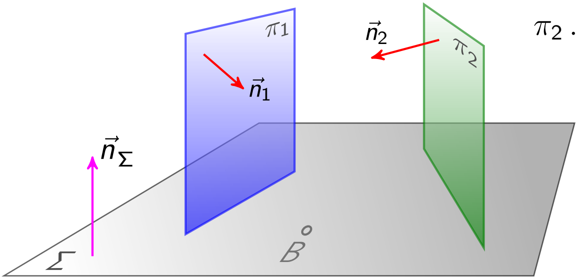
$B(-1, 2, -4)$

$\vec{n}_1 = (1, 3, -2)$

$\vec{n}_2 = (-4, 5, -1)$

$$\left.\begin{array}{l} \Sigma \perp \pi_1 \ \Rightarrow\ \vec{n}_\Sigma \perp \vec{n}_1 \\ \Sigma \perp \pi_2 \ \Rightarrow\ \vec{n}_\Sigma \perp \vec{n}_2 \end{array}\right\} \Rightarrow\ \vec{n}_\Sigma = \vec{n}_1 \times \vec{n}_2$$

Rješenje



$$\pi_1 \ldots x + 3y - 2z + 5 = 0$$

$$\pi_2 \ldots -4x + 5y - z + 3 = 0$$

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

$$\vec{n}_1 = (1, 3, -2)$$

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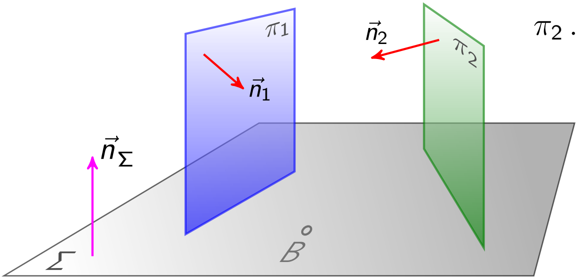

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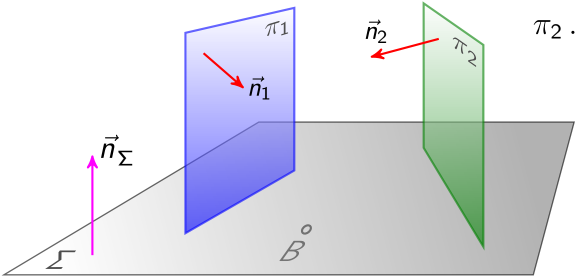

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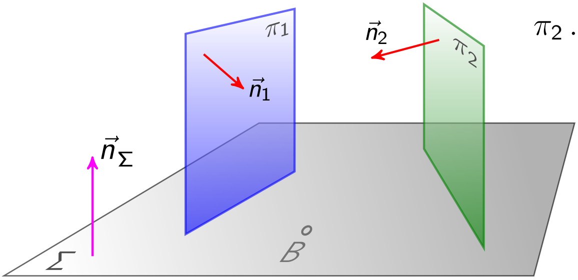

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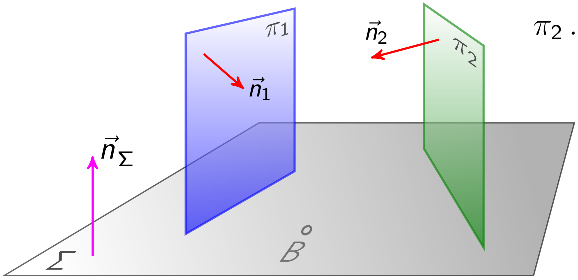

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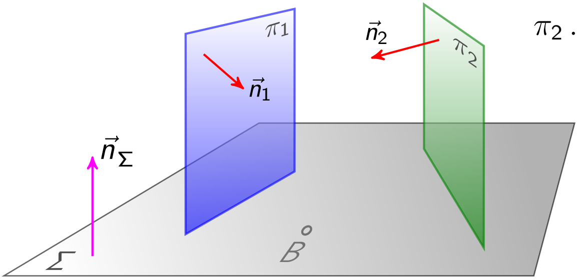

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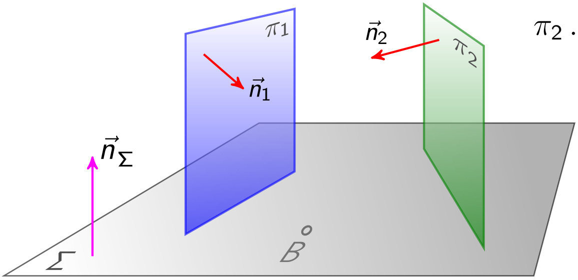

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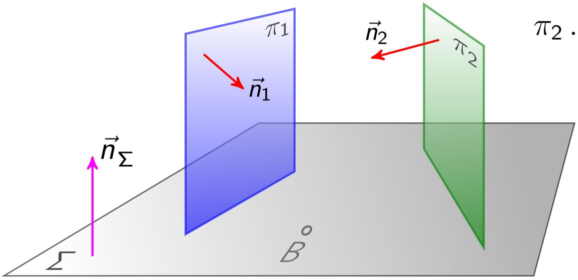

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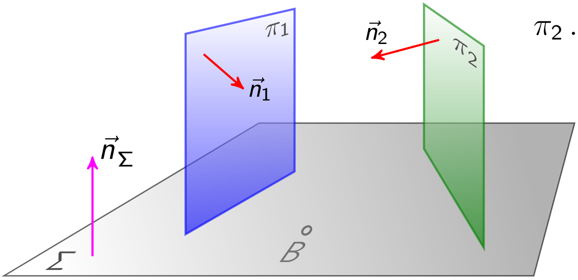
Rješenje



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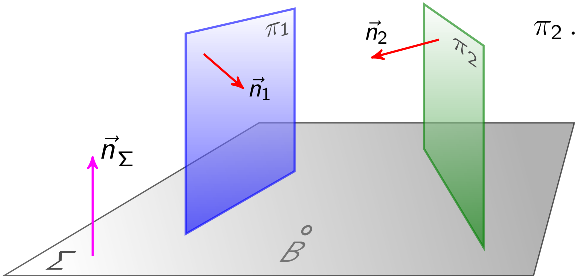
Rješenje



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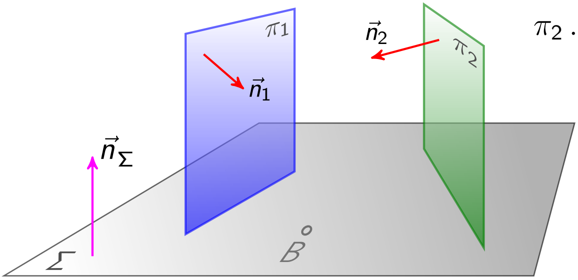

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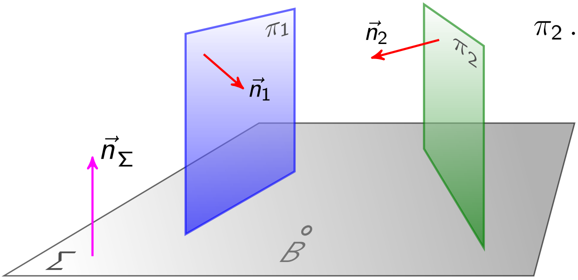

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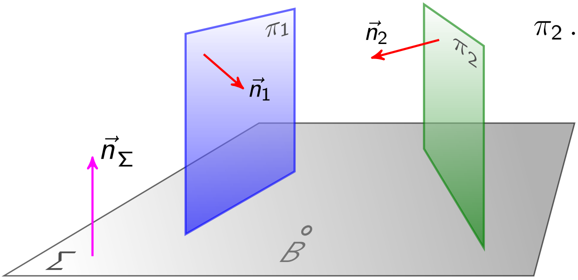

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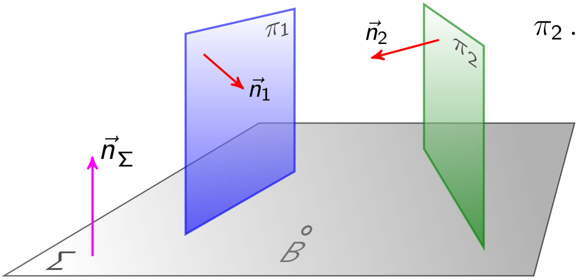

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$$7 \cdot (x - (-1)) + 9 \cdot$$

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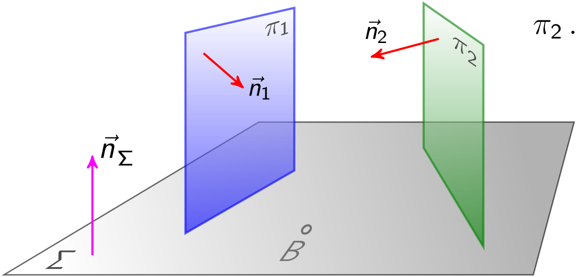

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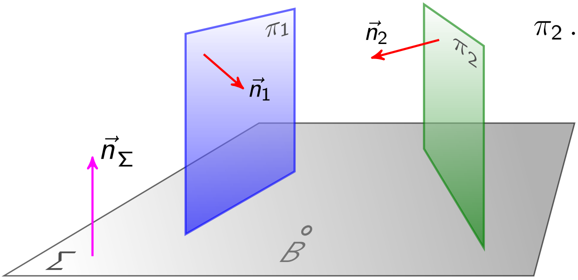

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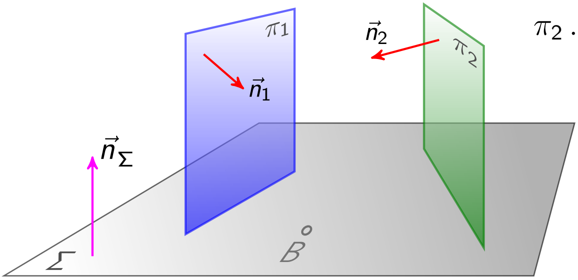

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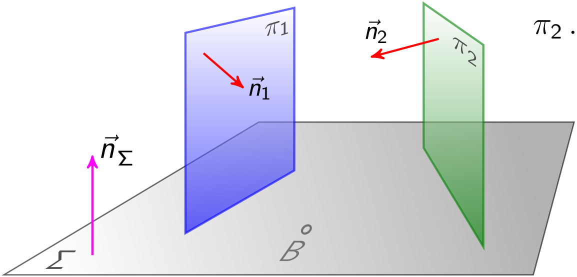
Rješenje



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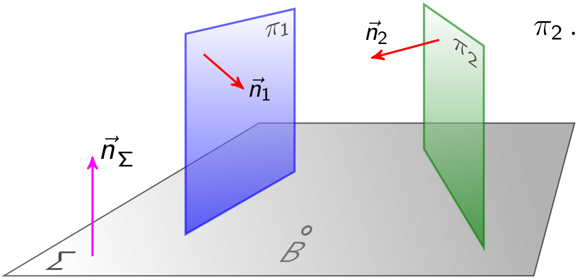
Rješenje



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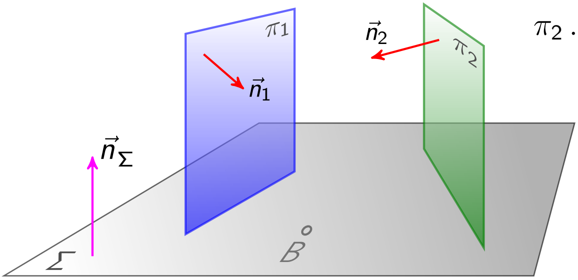
$$\Sigma \ldots$$

Rješenje



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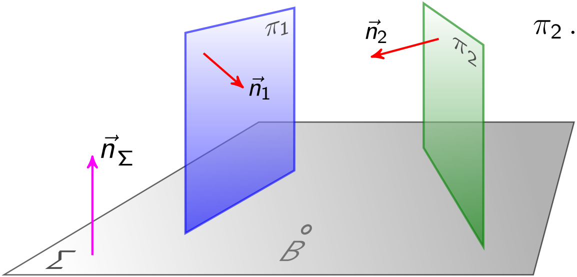
$$\Sigma \ldots\ 7x + 9y + 17z + 57 = 0$$

Rješenje



$$\pi_1 \ldots\ x + 3y - 2z + 5 = 0$$

$$\pi_2 \ldots\ -4x + 5y - z + 3 = 0$$

$$\begin{array}{c} \quad x_0 \quad y_0 \quad z_0 \\ B(-1, 2, -4) \end{array}$$

$$\vec{n}_1 = (1, 3, -2)$$

$$\vec{n}_2 = (-4, 5, -1)$$

$$\left.\begin{array}{l} \Sigma \perp \pi_1 \ \Rightarrow\ \vec{n}_\Sigma \perp \vec{n}_1 \\ \Sigma \perp \pi_2 \ \Rightarrow\ \vec{n}_\Sigma \perp \vec{n}_2 \end{array}\right\} \Rightarrow\ \vec{n}_\Sigma = \vec{n}_1 \times \vec{n}_2 = \begin{vmatrix} \vec{i} & \vec{j} & \vec{k} \\ 1 & 3 & -2 \\ -4 & 5 & -1 \end{vmatrix} = \begin{array}{c} A\ \ B\ \ C \\ (7, 9, 17) \end{array}$$

$$\Sigma \ldots\ A(x - x_0) + B(y - y_0) + C(z - z_0) = 0$$

$$7 \cdot (x - (-1)) + 9 \cdot (y - 2) + 17 \cdot (z - (-4)) = 0$$

$$\boxed{\Sigma \ldots\ 7x + 9y + 17z + 57 = 0}$$

peti zadatak

Zadatak 5

Zadani su pravac p i ravnina Σ svojim vektorskim jednadžbama

$$p \ldots \ \vec{r} = (2, 1, -1) + t \cdot (1, -1, 0),$$

$$\Sigma \ldots \ \vec{r} = (2, 1, 3) + u \cdot (1, 0, 0) + v \cdot (-1, 1, 2).$$

a) *Napišite parametarske jednadžbe i opći oblik jednadžbe ravnine Σ.*

b) *Odredite pravac q koji prolazi točkom* $T(1, 0, 4)$ *i siječe zadani pravac p te je paralelan s ravninom Σ.*

Rješenje

a) $\Sigma \ldots\ \vec{r} = (2,1,3) + u \cdot (1,0,0) + v \cdot (-1,1,2)$

Rješenje

a) $\Sigma \ldots \; \vec{r} = (2, 1, 3) + u \cdot (1, 0, 0) + v \cdot (-1, 1, 2)$

$T_0(2, 1, 3)$

Rješenje

a) $$\Sigma \ldots \; \vec{r} = (2, 1, 3) + u \cdot (1, 0, 0) + v \cdot (-1, 1, 2)$$

$$T_0(2, 1, 3) \qquad \vec{a} = (1, 0, 0)$$

Rješenje

a) $\Sigma \ldots \ \vec{r} = (2,1,3) + u \cdot (1,0,0) + v \cdot (-1,1,2)$

$T_0(2,1,3) \qquad \vec{a} = (1,0,0) \qquad \vec{b} = (-1,1,2)$

Rješenje

a) $\Sigma \ldots \; \vec{r} = (2,1,3) + u \cdot (1,0,0) + v \cdot (-1,1,2)$

$T_0(2,1,3) \qquad \vec{a} = (1,0,0) \qquad \vec{b} = (-1,1,2)$

Parametarske jednadžbe

Rješenje

a) $\Sigma \ldots \ \vec{r} = (2, 1, 3) + u \cdot (1, 0, 0) + v \cdot (-1, 1, 2)$

$T_0(2, 1, 3) \qquad \vec{a} = (1, 0, 0) \qquad \vec{b} = (-1, 1, 2)$

Parametarske jednadžbe

$$\Sigma \ldots \left\{ \begin{array}{l} \\ \\ \\ \end{array} \right.$$

Rješenje

(x, y, z)

a) $\Sigma \ldots \; \vec{r} = (2, 1, 3) + u \cdot (1, 0, 0) + v \cdot (-1, 1, 2)$

$T_0(2, 1, 3) \qquad \vec{a} = (1, 0, 0) \qquad \vec{b} = (-1, 1, 2)$

Parametarske jednadžbe

$$\Sigma \ldots \left\{ \begin{array}{l} \\ \\ \\ \end{array} \right.$$

Rješenje

(x, y, z)

a) $\qquad \Sigma \ldots \; \vec{r} = (2, 1, 3) + u \cdot (1, 0, 0) + v \cdot (-1, 1, 2)$

$T_0(2, 1, 3) \qquad \vec{a} = (1, 0, 0) \qquad \vec{b} = (-1, 1, 2)$

Parametarske jednadžbe

$$\Sigma \ldots \begin{cases} x = 2 + u - v \\ \\ \end{cases}$$

Rješenje

(x, y, z)

a) $\Sigma \ldots\ \vec{r} = (2,1,3) + u \cdot (1,0,0) + v \cdot (-1,1,2)$

$T_0(2,1,3)$ $\quad \vec{a} = (1,0,0)$ $\quad \vec{b} = (-1,1,2)$

Parametarske jednadžbe

$$\Sigma \ldots \begin{cases} x = 2 + u - v \\ y = 1 + v \\ \end{cases}$$

Rješenje

a) $$\Sigma \ldots \ \underbrace{\vec{r}}_{(x,y,z)} = (2,1,3) + u \cdot (1,0,0) + v \cdot (-1,1,2)$$

$T_0(2,1,3) \qquad \vec{a} = (1,0,0) \qquad \vec{b} = (-1,1,2)$

Parametarske jednadžbe

$$\Sigma \ldots \begin{cases} x = 2 + u - v \\ y = 1 + v \\ z = 3 + 2v \end{cases}$$

Rješenje

(x, y, z)

a) $\Sigma \ldots \; \vec{r} = (2, 1, 3) + u \cdot (1, 0, 0) + v \cdot (-1, 1, 2)$

$T_0(2, 1, 3) \qquad \vec{a} = (1, 0, 0) \qquad \vec{b} = (-1, 1, 2)$

Parametarske jednadžbe

$$\vec{n}_\Sigma = \vec{a} \times \vec{b}$$

$$\Sigma \ldots \begin{cases} x = 2 + u - v \\ y = 1 + v \\ z = 3 + 2v \end{cases}$$

Rješenje

(x, y, z)

a) $\Sigma \ldots \vec{r} = (2,1,3) + u \cdot (1,0,0) + v \cdot (-1,1,2)$

$T_0(2,1,3) \qquad \vec{a} = (1,0,0) \qquad \vec{b} = (-1,1,2)$

$$\vec{n}_\Sigma = \vec{a} \times \vec{b} = \left| \quad \right|$$

Parametarske jednadžbe

$$\Sigma \ldots \begin{cases} x = 2 + u - v \\ y = 1 + v \\ z = 3 + 2v \end{cases}$$

Rješenje

(x, y, z)

a) $$\Sigma \ldots \ \vec{r} = (2,1,3) + u \cdot (1,0,0) + v \cdot (-1,1,2)$$

$$T_0(2,1,3) \qquad \vec{a} = (1,0,0) \qquad \vec{b} = (-1,1,2)$$

$$\vec{n}_\Sigma = \vec{a} \times \vec{b} = \begin{vmatrix} \vec{i} & \vec{j} & \vec{k} \\ & & \\ & & \end{vmatrix}$$

Parametarske jednadžbe

$$\Sigma \ldots \begin{cases} x = 2 + u - v \\ y = 1 + v \\ z = 3 + 2v \end{cases}$$

Rješenje

a) $\Sigma \ldots \; \underbrace{\vec{r}}^{(x,y,z)} = (2, \underbrace{1}_{T_0(2,1,3)}, 3) + u \cdot (1, \underbrace{0}_{\vec{a}=(1,0,0)}, 0) + v \cdot (-1, \underbrace{1}_{\vec{b}=(-1,1,2)}, 2)$

$$\vec{n}_\Sigma = \vec{a} \times \vec{b} = \begin{vmatrix} \vec{i} & \vec{j} & \vec{k} \\ 1 & 0 & 0 \\ & & \end{vmatrix}$$

Parametarske jednadžbe

$$\Sigma \ldots \begin{cases} x = 2 + u - v \\ y = 1 + v \\ z = 3 + 2v \end{cases}$$

Rješenje

a) $\Sigma \ldots \underbrace{\vec{r}}_{(x,y,z)} = (2,1,3) + u \cdot (1,0,0) + v \cdot (-1,1,2)$

$T_0(2,1,3) \qquad \vec{a} = (1,0,0) \qquad \vec{b} = (-1,1,2)$

$$\vec{n}_\Sigma = \vec{a} \times \vec{b} = \begin{vmatrix} \vec{i} & \vec{j} & \vec{k} \\ 1 & 0 & 0 \\ -1 & 1 & 2 \end{vmatrix}$$

Parametarske jednadžbe

$$\Sigma \ldots \begin{cases} x = 2 + u - v \\ y = 1 + v \\ z = 3 + 2v \end{cases}$$

Rješenje

a) $\Sigma \ldots\ \vec{r} = (2,1,3) + u\cdot(1,0,0) + v\cdot(-1,1,2)$

(x,y,z)

$T_0(2,1,3) \qquad \vec{a} = (1,0,0) \qquad \vec{b} = (-1,1,2)$

$$\vec{n}_\Sigma = \vec{a}\times\vec{b} = \begin{vmatrix} \vec{i} & \vec{j} & \vec{k} \\ 1 & 0 & 0 \\ -1 & 1 & 2 \end{vmatrix} = ($$

Parametarske jednadžbe

$$\Sigma \ldots \begin{cases} x = 2 + u - v \\ y = 1 + v \\ z = 3 + 2v \end{cases}$$

Rješenje

a) $\Sigma \ldots \; \vec{r} = (2,1,3) + u \cdot (1,0,0) + v \cdot (-1,1,2)$

(x,y,z)

$T_0(2,1,3) \qquad \vec{a} = (1,0,0) \qquad \vec{b} = (-1,1,2)$

$$\vec{n}_\Sigma = \vec{a} \times \vec{b} = \begin{vmatrix} \vec{i} & \vec{j} & \vec{k} \\ 1 & 0 & 0 \\ -1 & 1 & 2 \end{vmatrix} = (0,$$

Parametarske jednadžbe

$$\Sigma \ldots \begin{cases} x = 2 + u - v \\ y = 1 + v \\ z = 3 + 2v \end{cases}$$

Rješenje

a) $\Sigma \ldots \vec{r} = (2,1,3) + u \cdot (1,0,0) + v \cdot (-1,1,2)$

(x, y, z)

$T_0(2,1,3) \qquad \vec{a} = (1,0,0) \qquad \vec{b} = (-1,1,2)$

$$\vec{n}_\Sigma = \vec{a} \times \vec{b} = \begin{vmatrix} \vec{i} & \vec{j} & \vec{k} \\ 1 & 0 & 0 \\ -1 & 1 & 2 \end{vmatrix} = (0, -2,$$

Parametarske jednadžbe

$$\Sigma \ldots \begin{cases} x = 2 + u - v \\ y = 1 + v \\ z = 3 + 2v \end{cases}$$

Rješenje

a) $\Sigma \ldots \; \vec{r} = (2,1,3) + u \cdot (1,0,0) + v \cdot (-1,1,2)$

(x, y, z)

$T_0(2,1,3) \qquad \vec{a} = (1,0,0) \qquad \vec{b} = (-1,1,2)$

$$\vec{n}_\Sigma = \vec{a} \times \vec{b} = \begin{vmatrix} \vec{i} & \vec{j} & \vec{k} \\ 1 & 0 & 0 \\ -1 & 1 & 2 \end{vmatrix} = (0, -2, 1)$$

Parametarske jednadžbe

$$\Sigma \ldots \begin{cases} x = 2 + u - v \\ y = 1 + v \\ z = 3 + 2v \end{cases}$$

Rješenje

(x, y, z)

a) $\Sigma \ldots \ \vec{r} = (2,1,3) + u \cdot (1,0,0) + v \cdot (-1,1,2)$

$T_0(2,1,3) \qquad \vec{a} = (1,0,0) \qquad \vec{b} = (-1,1,2)$

$$\vec{n}_\Sigma = \vec{a} \times \vec{b} = \begin{vmatrix} \vec{i} & \vec{j} & \vec{k} \\ 1 & 0 & 0 \\ -1 & 1 & 2 \end{vmatrix} = (0, -2, 1)$$

Parametarske jednadžbe

$$\Sigma \ldots \begin{cases} x = 2 + u - v \\ y = 1 + v \\ z = 3 + 2v \end{cases}$$

$$\Sigma \ldots \ A(x - x_0) + B(y - y_0) + C(z - z_0) = 0$$

Rješenje

a) $$\Sigma \ldots \underbrace{\vec{r}}_{(x,y,z)} = (2,1,3) + u \cdot (1,0,0) + v \cdot (-1,1,2)$$

$$T_0(2,1,3) \qquad \vec{a} = (1,0,0) \qquad \vec{b} = (-1,1,2)$$

$$\vec{n}_\Sigma = \vec{a} \times \vec{b} = \begin{vmatrix} \vec{i} & \vec{j} & \vec{k} \\ 1 & 0 & 0 \\ -1 & 1 & 2 \end{vmatrix} = (\overset{A}{0}, \overset{B}{-2}, \overset{C}{1})$$

Parametarske jednadžbe

$$\Sigma \ldots \begin{cases} x = 2 + u - v \\ y = 1 + v \\ z = 3 + 2v \end{cases}$$

$$\Sigma \ldots A(x - x_0) + B(y - y_0) + C(z - z_0) = 0$$

Rješenje

a) $\Sigma \ldots\ \overset{(x,y,z)}{\vec{r}} = (\overset{x_0}{2}, \overset{y_0}{1}, \overset{z_0}{3}) + u \cdot (1,0,0) + v \cdot (-1,1,2)$

$$T_0(2,1,3) \qquad \vec{a} = (1,0,0) \qquad \vec{b} = (-1,1,2)$$

Parametarske jednadžbe

$$\vec{n}_\Sigma = \vec{a} \times \vec{b} = \begin{vmatrix} \vec{i} & \vec{j} & \vec{k} \\ 1 & 0 & 0 \\ -1 & 1 & 2 \end{vmatrix} = (\overset{A}{0}, \overset{B}{-2}, \overset{C}{1})$$

$$\Sigma \ldots \begin{cases} x = 2 + u - v \\ y = 1 + v \\ z = 3 + 2v \end{cases}$$

$$\Sigma \ldots\ A(x - x_0) + B(y - y_0) + C(z - z_0) = 0$$

Rješenje

(x, y, z)

a) $$\Sigma \ldots \ \vec{r} = (2,1,3) + u \cdot (1,0,0) + v \cdot (-1,1,2)$$

$$\underset{}{T_0(\overset{x_0}{2}, \overset{y_0}{1}, \overset{z_0}{3})} \qquad \vec{a} = (1,0,0) \qquad \vec{b} = (-1,1,2)$$

$$\vec{n}_\Sigma = \vec{a} \times \vec{b} = \begin{vmatrix} \vec{i} & \vec{j} & \vec{k} \\ 1 & 0 & 0 \\ -1 & 1 & 2 \end{vmatrix} = (\overset{A}{0}, \overset{B}{-2}, \overset{C}{1})$$

Parametarske jednadžbe

$$\Sigma \ldots \begin{cases} x = 2 + u - v \\ y = 1 + v \\ z = 3 + 2v \end{cases}$$

$$\Sigma \ldots \ A(x - x_0) + B(y - y_0) + C(z - z_0) = 0$$

$0 \cdot$

Rješenje

(x, y, z)

a) $\Sigma \ldots \ \vec{r} = (2, 1, 3) + u \cdot (1, 0, 0) + v \cdot (-1, 1, 2)$

$x_0 \ y_0 \ z_0$

$T_0(2, 1, 3) \qquad \vec{a} = (1, 0, 0) \qquad \vec{b} = (-1, 1, 2)$

$$\vec{n}_\Sigma = \vec{a} \times \vec{b} = \begin{vmatrix} \vec{i} & \vec{j} & \vec{k} \\ 1 & 0 & 0 \\ -1 & 1 & 2 \end{vmatrix} = (\overset{A}{0}, \overset{B}{-2}, \overset{C}{1})$$

Parametarske jednadžbe

$$\Sigma \ldots \begin{cases} x = 2 + u - v \\ y = 1 + v \\ z = 3 + 2v \end{cases}$$

$$\Sigma \ldots \ A(x - x_0) + B(y - y_0) + C(z - z_0) = 0$$

$$0 \cdot (x - 2)$$

Rješenje

a) $\Sigma \ldots \ \vec{r} = (2,1,3) + u \cdot (1,0,0) + v \cdot (-1,1,2)$, $\vec{r} = (x, y, z)$

$$\underset{x_0\ y_0\ z_0}{T_0(2,1,3)} \qquad \vec{a} = (1,0,0) \qquad \vec{b} = (-1,1,2)$$

$$\vec{n}_\Sigma = \vec{a} \times \vec{b} = \begin{vmatrix} \vec{i} & \vec{j} & \vec{k} \\ 1 & 0 & 0 \\ -1 & 1 & 2 \end{vmatrix} = \overset{A\quad B\quad C}{(0, -2, 1)}$$

Parametarske jednadžbe

$$\Sigma \ldots \begin{cases} x = 2 + u - v \\ y = 1 + v \\ z = 3 + 2v \end{cases}$$

$$\Sigma \ldots \ A(x - x_0) + B(y - y_0) + C(z - z_0) = 0$$

$$0 \cdot (x - 2) + (-2) \cdot$$

Rješenje

a) $\Sigma \ldots \ \vec{r} = (2,1,3) + u\cdot(1,0,0) + v\cdot(-1,1,2)$, $\vec{r} = (x,y,z)$

$T_0(\overset{x_0}{2},\overset{y_0}{1},\overset{z_0}{3})$ $\quad \vec{a} = (1,0,0)$ $\quad \vec{b} = (-1,1,2)$

$$\vec{n}_\Sigma = \vec{a}\times\vec{b} = \begin{vmatrix} \vec{i} & \vec{j} & \vec{k} \\ 1 & 0 & 0 \\ -1 & 1 & 2 \end{vmatrix} = (\overset{A}{0}, \overset{B}{-2}, \overset{C}{1})$$

$\boxed{\text{Parametarske jednadžbe}}$

$$\Sigma \ldots \begin{cases} x = 2 + u - v \\ y = 1 + v \\ z = 3 + 2v \end{cases}$$

$$\Sigma \ldots \ A(x - x_0) + B(y - y_0) + C(z - z_0) = 0$$

$$0\cdot(x-2) + (-2)\cdot(y-1)$$

Rješenje

a) $\Sigma \ldots \overset{(x,y,z)}{\vec{r}} = (\overset{x_0\, y_0\, z_0}{2,1,3}) + u \cdot (1,0,0) + v \cdot (-1,1,2)$

$T_0(2,1,3) \qquad \vec{a} = (1,0,0) \qquad \vec{b} = (-1,1,2)$

$$\vec{n}_\Sigma = \vec{a} \times \vec{b} = \begin{vmatrix} \vec{i} & \vec{j} & \vec{k} \\ 1 & 0 & 0 \\ -1 & 1 & 2 \end{vmatrix} = (\overset{A}{0}, \overset{B}{-2}, \overset{C}{1})$$

Parametarske jednadžbe

$$\Sigma \ldots \begin{cases} x = 2 + u - v \\ y = 1 + v \\ z = 3 + 2v \end{cases}$$

$$\Sigma \ldots A(x - x_0) + B(y - y_0) + C(z - z_0) = 0$$

$$0 \cdot (x - 2) + (-2) \cdot (y - 1) + 1 \cdot$$

Rješenje

a) $$\Sigma \ldots \ \overset{(x,y,z)}{\vec{r}} = (\overset{x_0\ y_0\ z_0}{2,1,3}) + u \cdot (1,0,0) + v \cdot (-1,1,2)$$

$$T_0(2,1,3) \qquad \vec{a} = (1,0,0) \qquad \vec{b} = (-1,1,2)$$

$$\vec{n}_\Sigma = \vec{a} \times \vec{b} = \begin{vmatrix} \vec{i} & \vec{j} & \vec{k} \\ 1 & 0 & 0 \\ -1 & 1 & 2 \end{vmatrix} = (\overset{A}{0}, \overset{B}{-2}, \overset{C}{1})$$

Parametarske jednadžbe

$$\Sigma \ldots \begin{cases} x = 2 + u - v \\ y = 1 + v \\ z = 3 + 2v \end{cases}$$

$$\Sigma \ldots \ A(x - x_0) + B(y - y_0) + C(z - z_0) = 0$$

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

Rješenje

a)

$$\Sigma \ldots \overset{(x,y,z)}{\vec{r}} = (2,1,3) + u \cdot (1,0,0) + v \cdot (-1,1,2)$$

$$\overset{x_0\ y_0\ z_0}{T_0(2,1,3)} \qquad \vec{a} = (1,0,0) \qquad \vec{b} = (-1,1,2)$$

$$\vec{n}_\Sigma = \vec{a} \times \vec{b} = \begin{vmatrix} \vec{i} & \vec{j} & \vec{k} \\ 1 & 0 & 0 \\ -1 & 1 & 2 \end{vmatrix} = \overset{A\quad B\quad C}{(0,-2,1)}$$

Parametarske jednadžbe

$$\Sigma \ldots \begin{cases} x = 2 + u - v \\ y = 1 + v \\ z = 3 + 2v \end{cases}$$

$$\Sigma \ldots A(x - x_0) + B(y - y_0) + C(z - z_0) = 0$$

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

Rješenje

a) $$\Sigma \ldots \ \underset{}{\overset{(x,y,z)}{\vec{r}}} = (2,1,3) + u \cdot (1,0,0) + v \cdot (-1,1,2)$$

$$T_0(\overset{x_0}{2}, \overset{y_0}{1}, \overset{z_0}{3}) \qquad \vec{a} = (1,0,0) \qquad \vec{b} = (-1,1,2)$$

$$\vec{n}_\Sigma = \vec{a} \times \vec{b} = \begin{vmatrix} \vec{i} & \vec{j} & \vec{k} \\ 1 & 0 & 0 \\ -1 & 1 & 2 \end{vmatrix} = (\overset{A}{0}, \overset{B}{-2}, \overset{C}{1})$$

Parametarske jednadžbe

$$\Sigma \ldots \begin{cases} x = 2 + u - v \\ y = 1 + v \\ z = 3 + 2v \end{cases}$$

$$\Sigma \ldots \ A(x - x_0) + B(y - y_0) + C(z - z_0) = 0$$

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

$$\Sigma \ldots$$

Rješenje

a) $$\Sigma \ldots\ \overset{(x,y,z)}{\vec{r}} = (\overset{x_0\ y_0\ z_0}{2,1,3}) + u \cdot (1,0,0) + v \cdot (-1,1,2)$$

$$T_0(2,1,3) \qquad \vec{a} = (1,0,0) \qquad \vec{b} = (-1,1,2)$$

$$\vec{n}_\Sigma = \vec{a} \times \vec{b} = \begin{vmatrix} \vec{i} & \vec{j} & \vec{k} \\ 1 & 0 & 0 \\ -1 & 1 & 2 \end{vmatrix} = (\overset{A}{0}, \overset{B}{-2}, \overset{C}{1})$$

Parametarske jednadžbe

$$\Sigma \ldots \begin{cases} x = 2 + u - v \\ y = 1 + v \\ z = 3 + 2v \end{cases}$$

$$\Sigma \ldots\ A(x - x_0) + B(y - y_0) + C(z - z_0) = 0$$

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

$$\Sigma \ldots\ -2y + z - 1 = 0$$

Rješenje

$$(x, y, z)$$

a) $$\Sigma \ldots \; \vec{r} = (2,1,3) + u\cdot(1,0,0) + v\cdot(-1,1,2)$$

$$\overset{x_0\;y_0\;z_0}{T_0(2,1,3)} \qquad \vec{a} = (1,0,0) \qquad \vec{b} = (-1,1,2)$$

$$\vec{n}_\Sigma = \vec{a}\times\vec{b} = \begin{vmatrix} \vec{i} & \vec{j} & \vec{k} \\ 1 & 0 & 0 \\ -1 & 1 & 2 \end{vmatrix} = \overset{A\;\;B\;\;C}{(0,-2,1)}$$

Parametarske jednadžbe

$$\Sigma \ldots \begin{cases} x = 2 + u - v \\ y = 1 + v \\ z = 3 + 2v \end{cases}$$

$$\Sigma \ldots \; A(x - x_0) + B(y - y_0) + C(z - z_0) = 0$$

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

$$\boxed{\Sigma \ldots \; -2y + z - 1 = 0}$$

Rješenje

a) $$\Sigma \ldots \ \overset{(x,y,z)}{\vec{r}} = (\underbrace{2,1,3}_{T_0(2,1,3)}) + u \cdot (\underbrace{1,0,0}_{\vec{a}=(1,0,0)}) + v \cdot (\underbrace{-1,1,2}_{\vec{b}=(-1,1,2)})$$

$$T_0(\overset{x_0}{2}, \overset{y_0}{1}, \overset{z_0}{3}) \qquad \vec{a} = (1,0,0) \qquad \vec{b} = (-1,1,2)$$

$$\vec{n}_\Sigma = \vec{a} \times \vec{b} = \begin{vmatrix} \vec{i} & \vec{j} & \vec{k} \\ 1 & 0 & 0 \\ -1 & 1 & 2 \end{vmatrix} = (\overset{A}{0}, \overset{B}{-2}, \overset{C}{1})$$

Parametarske jednadžbe

$$\Sigma \ldots \begin{cases} x = 2 + u - v \\ y = 1 + v \\ z = 3 + 2v \end{cases}$$

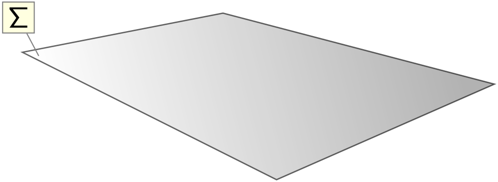
$$\Sigma \ldots \ A(x - x_0) + B(y - y_0) + C(z - z_0) = 0$$

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

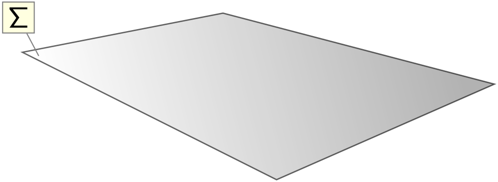
$$\boxed{\Sigma \ldots \ -2y + z - 1 = 0}$$

opći oblik

b)

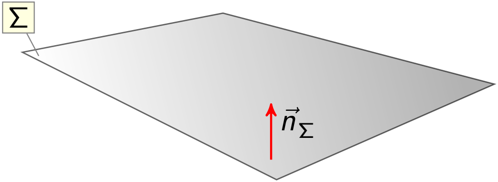


b)



$\Sigma \ldots -2y + z - 1 = 0$

b)



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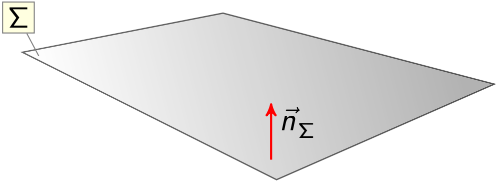

$$\vec{n}_\Sigma = (0, -2, 1)$$

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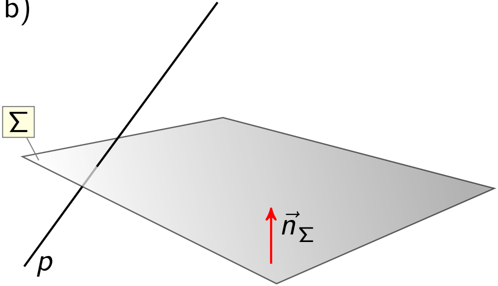

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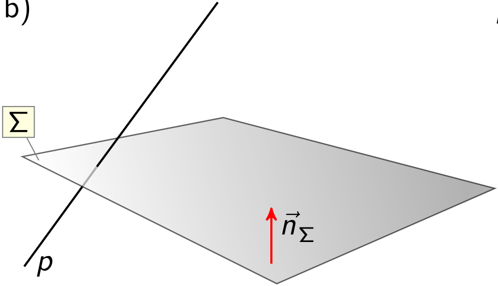
$p \ldots \ \vec{r} = (2, 1, -1) + t \cdot (1, -1, 0)$



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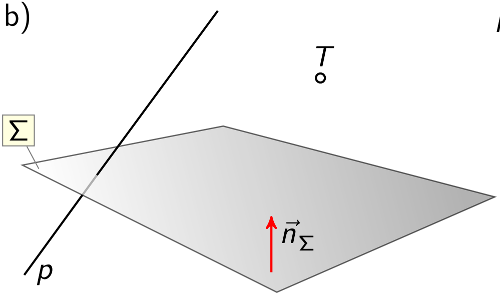

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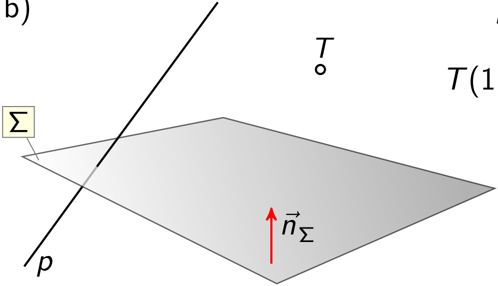

$T(1, 0, 4)$

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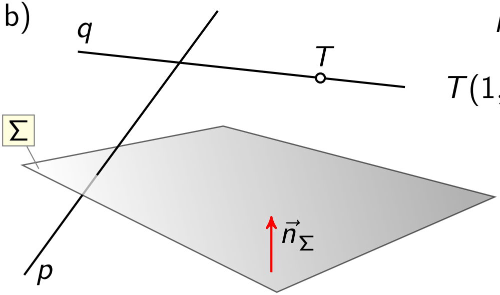

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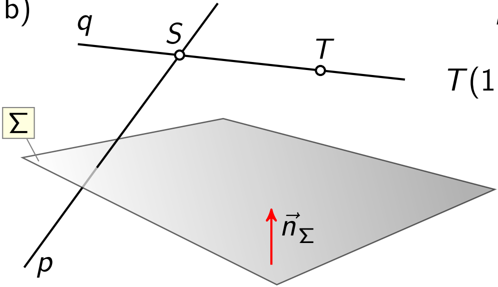

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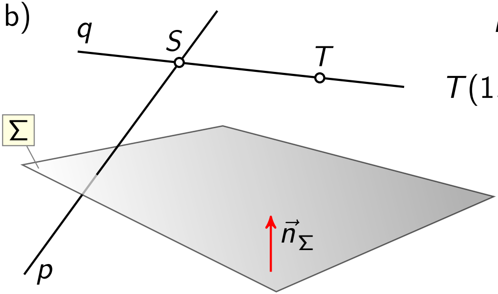

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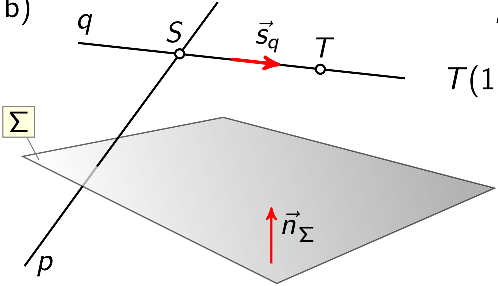

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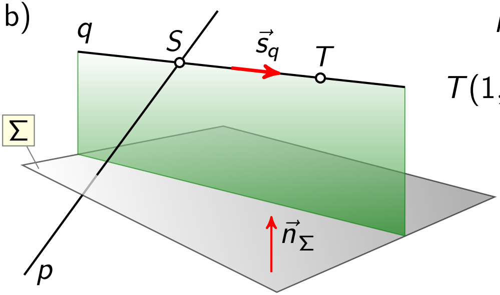

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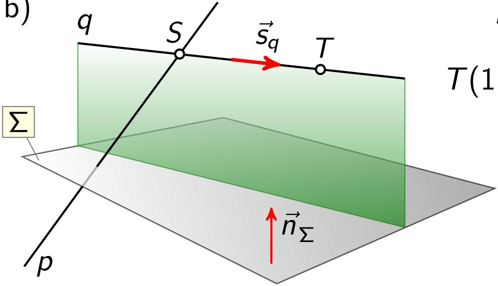

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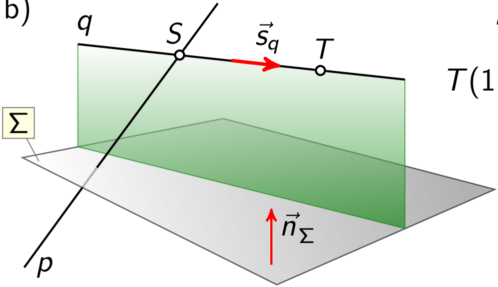
$q \parallel \Sigma \;\Rightarrow\; \overrightarrow{ST} \perp \vec{n}_\Sigma$

b)



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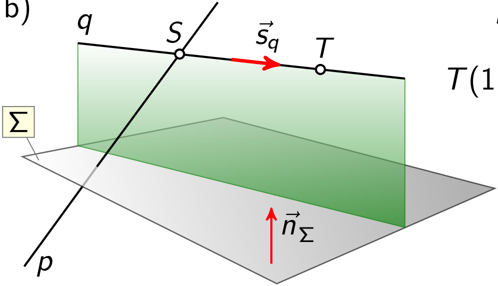
b) 

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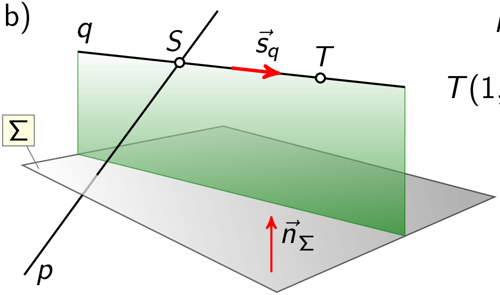

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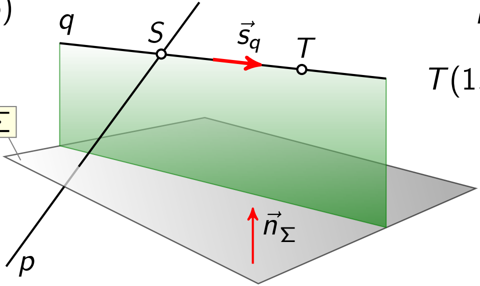

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(x, y, z)

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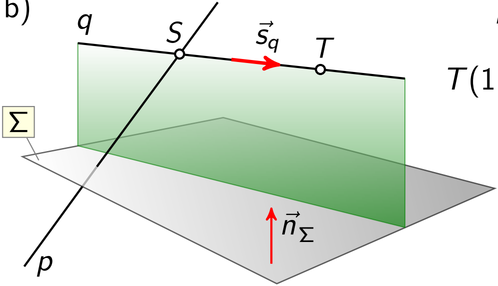

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$p \ldots \; \vec{r} = (2,1,-1) + t \cdot (1,-1,0)$

(x, y, z)

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$\vec{n}_\Sigma = (0,-2,1)$

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$$q \parallel \Sigma \;\Rightarrow\; \overrightarrow{ST} \perp \vec{n}_\Sigma \;\Rightarrow\; \boxed{\overrightarrow{ST} \cdot \vec{n}_\Sigma = 0}$$

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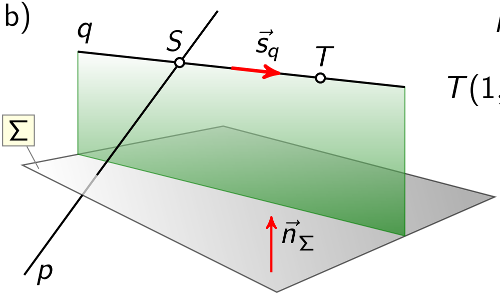

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(x, y, z)

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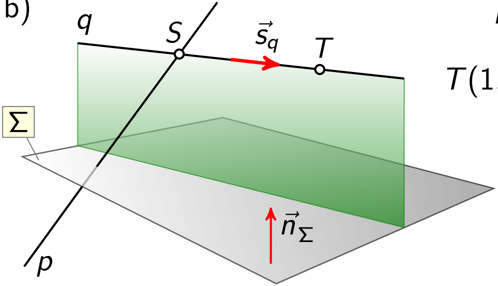

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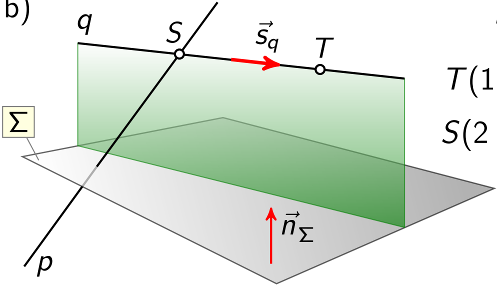

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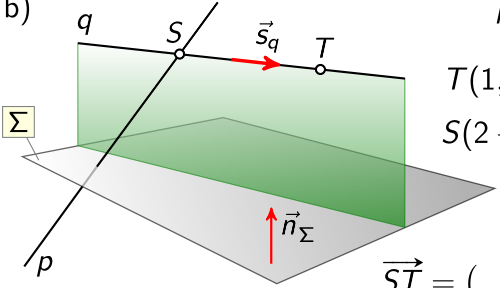

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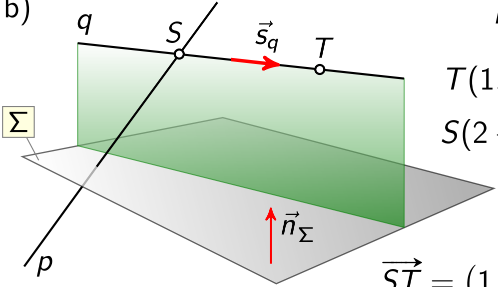

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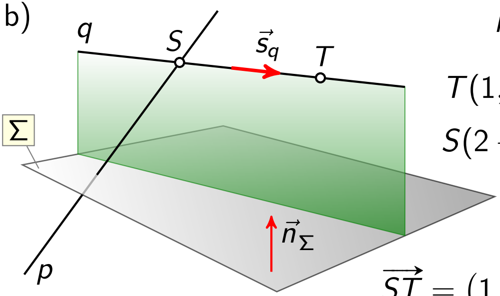

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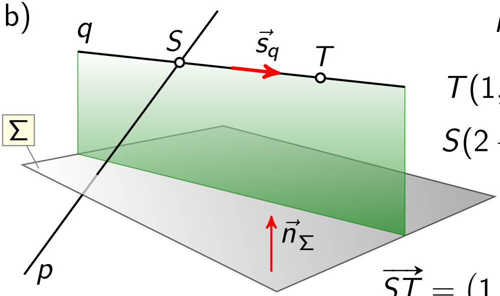

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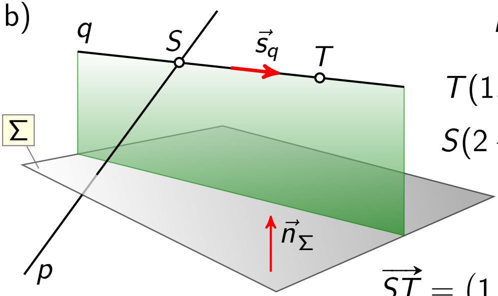

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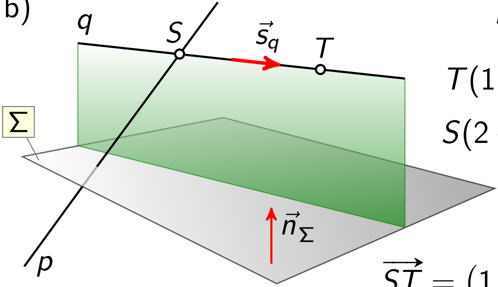

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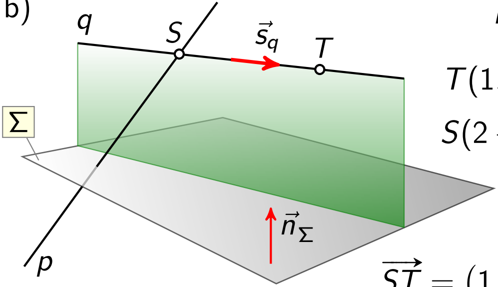

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$S(2 + t, 1 - t, -1)$

$$\overrightarrow{ST} = \big(1 - (2 + t),\ 0 - (1 - t),\ 4 - (-1)\big)$$

$$\overrightarrow{ST} = (-1 - t, t - 1,$$

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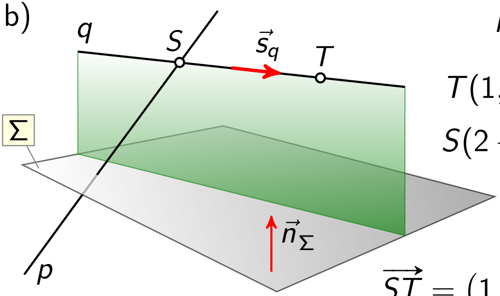

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$$\overrightarrow{ST} = \big(1 - (2+t),\; 0 - (1-t),\; 4 - (-1)\big)$$

$$\overrightarrow{ST} = (-1 - t, t - 1, 5)$$

$$\vec{n}_\Sigma = (0, -2, 1)$$

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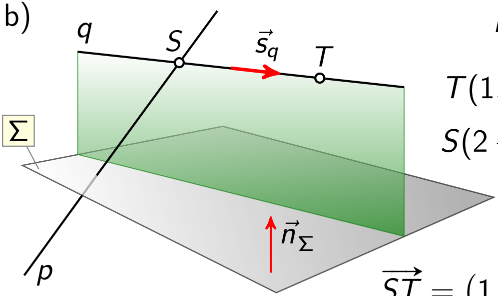

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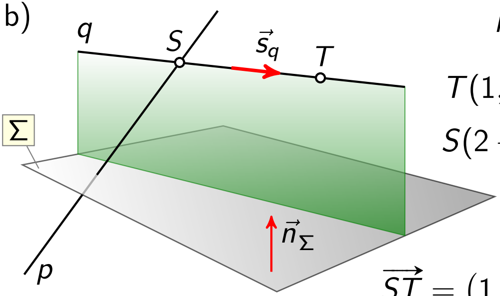
$$(-1-t, t-1, 5) \cdot$$

b)



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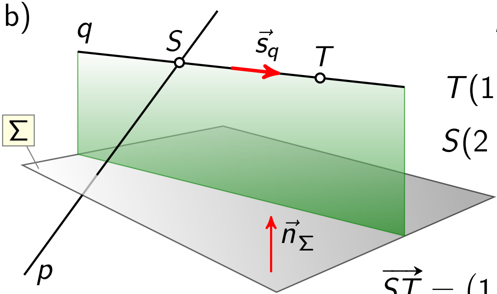
$(-1-t, t-1, 5) \cdot (0, -2, 1)$

b)



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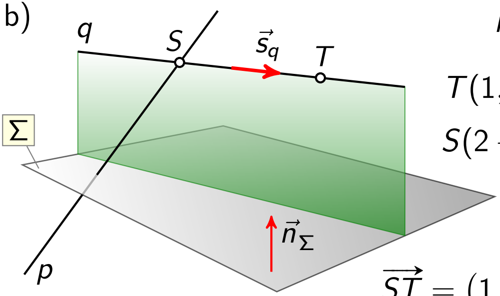

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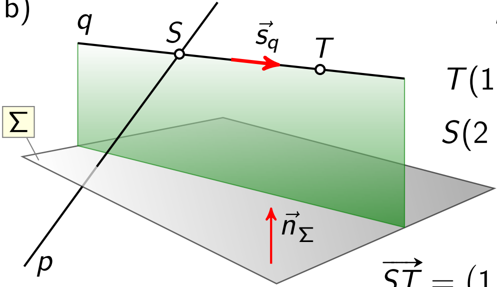
$$(-1-t, t-1, 5)\cdot(0,-2,1) = 0$$

$$(-1-t)\cdot 0$$

b)



$$p \ldots \; \vec{r} = (2, 1, -1) + t \cdot (1, -1, 0)$$

(x, y, z)

$T(1, 0, 4)$

$S(2 + t, 1 - t, -1)$

$$p \ldots \begin{cases} x = 2 + t \\ y = 1 - t \\ z = -1 \end{cases}$$

$$\vec{n}_\Sigma = (0, -2, 1)$$

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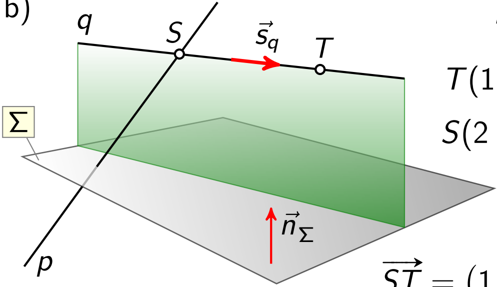
$$(-1 - t, t - 1, 5) \cdot (0, -2, 1) = 0$$

$$(-1 - t) \cdot 0 + (t - 1) \cdot (-2)$$

b)



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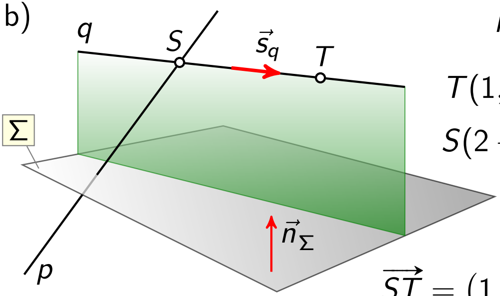

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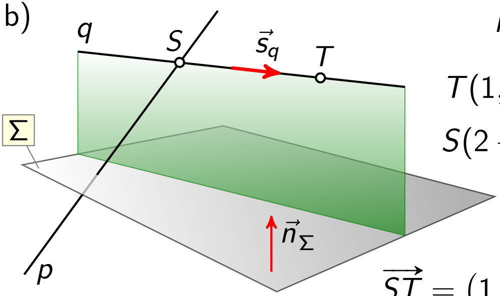

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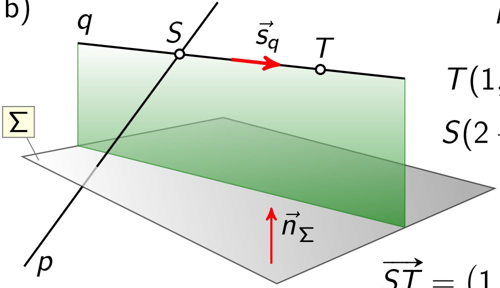
b)



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$$-2t + 7 = 0 \rightsquigarrow t = \frac{7}{2}$$

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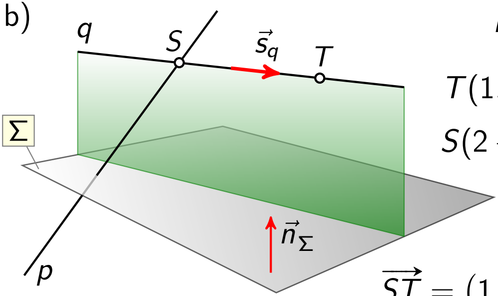

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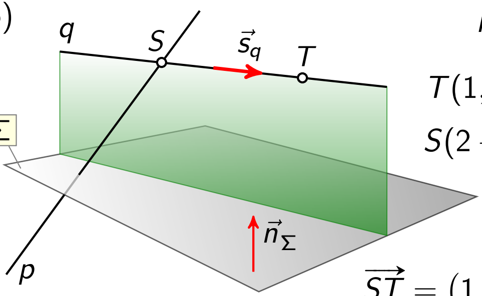

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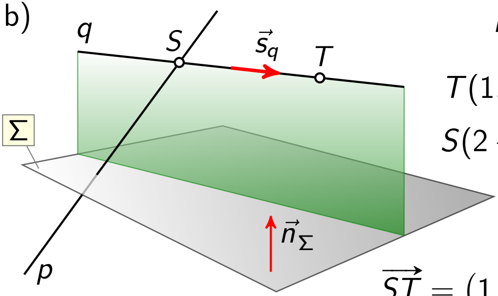

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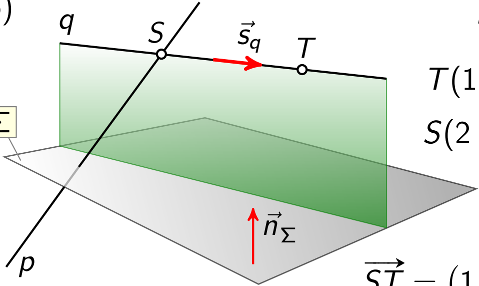

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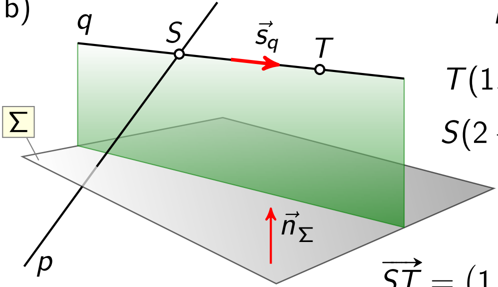

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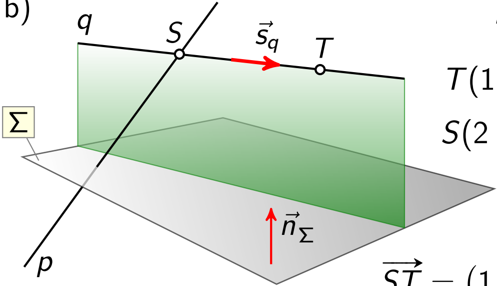

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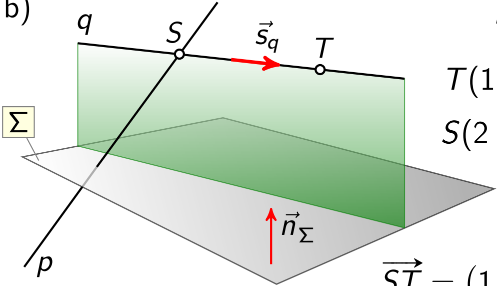
$$\overrightarrow{ST} = \left(-\frac{9}{2}, \frac{5}{2}, 5\right)$$

$$\vec{s}_q = 2 \cdot \overrightarrow{ST}$$

b)



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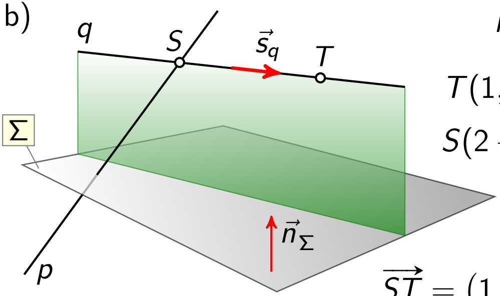
$$\vec{s}_q = 2 \cdot \overrightarrow{ST} = (-9, 5, 10)$$

b)



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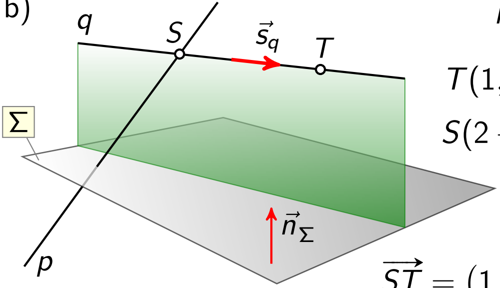
$$q \ldots T, \vec{s}_q$$

b)



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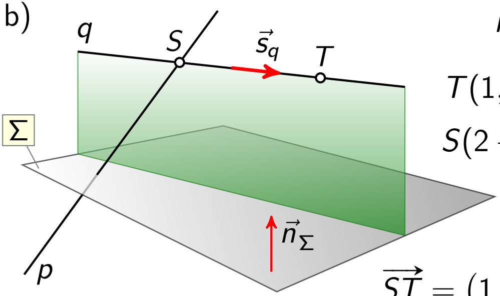

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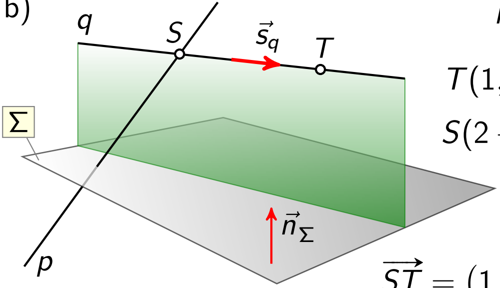
$q \ldots T, \vec{s}_q$

b)



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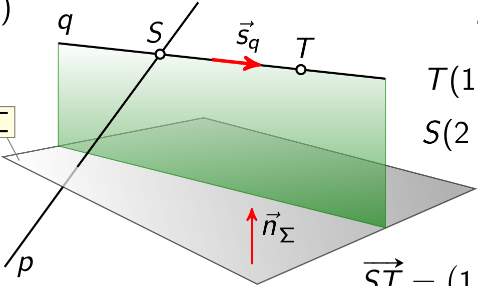

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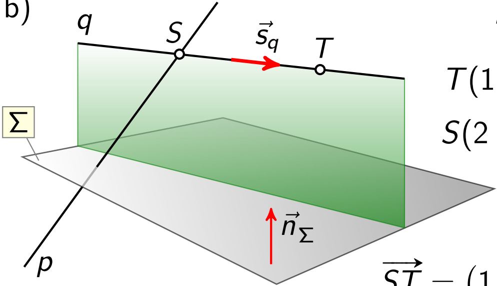
b)



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$T(1, 0, 4)$

$S(2 + t, 1 - t, -1)$

$\vec{n}_\Sigma = (0, -2, 1)$

$\Sigma \dots -2y + z - 1 = 0$

$$q \parallel \Sigma \ \Rightarrow \ \overrightarrow{ST} \perp \vec{n}_\Sigma \ \Rightarrow \ \boxed{\overrightarrow{ST} \cdot \vec{n}_\Sigma = 0}$$

$$\overrightarrow{ST} = \left(1 - (2 + t),\ 0 - (1 - t),\ 4 - (-1)\right)$$

$$\overrightarrow{ST} = (-1 - t, t - 1, 5)$$

$$(-1 - t, t - 1, 5) \cdot (0, -2, 1) = 0$$

$$(-1 - t) \cdot 0 + (t - 1) \cdot (-2) + 5 \cdot 1 = 0$$

$$-2t + 7 = 0 \rightsquigarrow \boxed{t = \frac{7}{2}}$$

$$S\left(\frac{11}{2}, -\frac{5}{2}, -1\right)$$

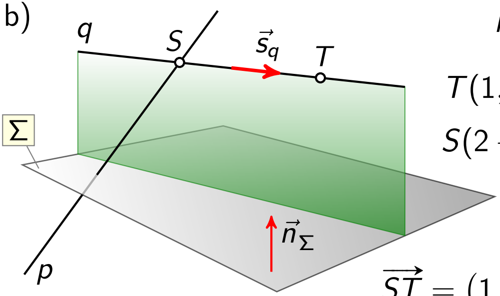
$$\overrightarrow{ST} = \left(-\frac{9}{2}, \frac{5}{2}, 5\right)$$

$$\vec{s}_q = 2 \cdot \overrightarrow{ST} = (-9, 5, 10)$$

$$q \dots \frac{x - 1}{-9} = \frac{y}{5} = \frac{z - 4}{10}$$

$q \dots T, \vec{s}_q$

b)



$$p \ldots \ \vec{r} = (2,1,-1) + t\cdot(1,-1,0)$$

(x, y, z)

$T(1,0,4)$

$$p \ldots \begin{cases} x = 2 + t \\ y = 1 - t \\ z = -1 \end{cases}$$

$S(2+t, 1-t, -1)$

$$S\left(\frac{11}{2}, -\frac{5}{2}, -1\right)$$

$$\overrightarrow{ST} = \big(1-(2+t),\ 0-(1-t),\ 4-(-1)\big)$$

$$\overrightarrow{ST} = (-1-t, t-1, 5)$$

$$\vec{n}_\Sigma = (0,-2,1)$$

$$\Sigma \ldots -2y + z - 1 = 0$$

$$\overrightarrow{ST} = \left(-\frac{9}{2}, \frac{5}{2}, 5\right)$$

$$q \parallel \Sigma \ \Rightarrow\ \overrightarrow{ST} \perp \vec{n}_\Sigma \ \Rightarrow\ \boxed{\overrightarrow{ST}\cdot\vec{n}_\Sigma = 0}$$

$$\vec{s}_q = 2\cdot\overrightarrow{ST} = (-9, 5, 10)$$

$$(-1-t, t-1, 5)\cdot(0,-2,1) = 0$$

$$(-1-t)\cdot 0 + (t-1)\cdot(-2) + 5\cdot 1 = 0$$

$$\boxed{q \ldots \ \frac{x-1}{-9} = \frac{y}{5} = \frac{z-4}{10}}$$

$$-2t + 7 = 0 \rightsquigarrow \boxed{t = \frac{7}{2}}$$

$$q \ldots T, \vec{s}_q$$