Seminari 3

Matematičke metode za informatičare

Damir Horvat

FOI, Varaždin

Sadržaj

Ponavljanje teorije

prvi zadatak

drugi zadatak

treći zadatak

četvrti zadatak

Koordinate djelišne točke

Parametrizacija dužine i pravca

Ponavljanje teorije

Skalarni produkt vektora

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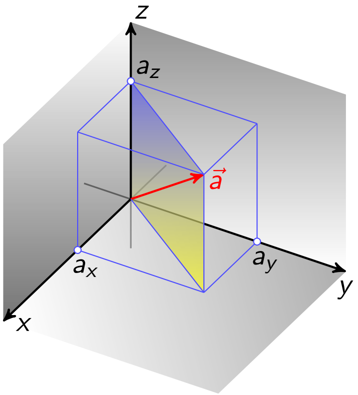

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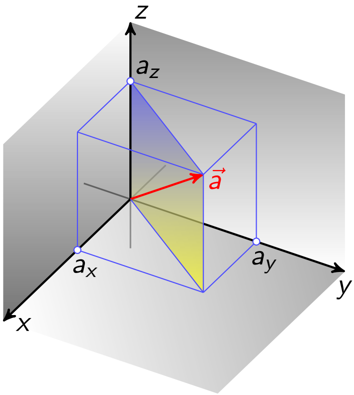

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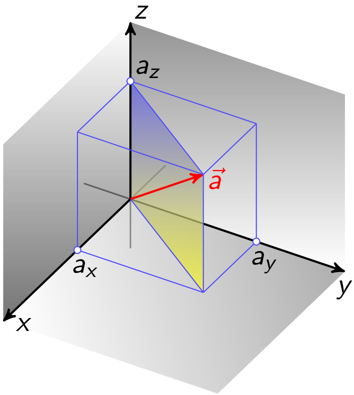

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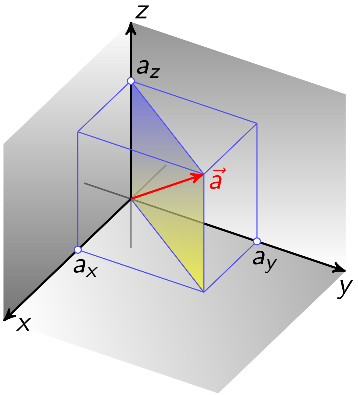

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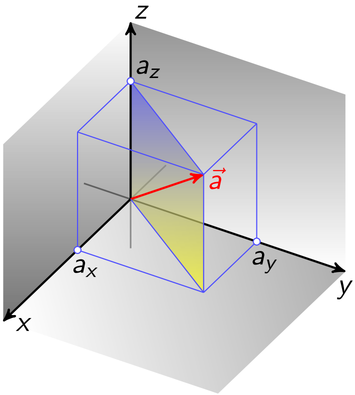

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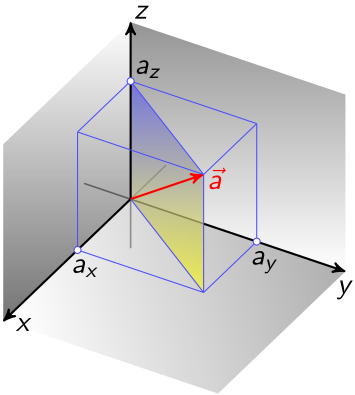

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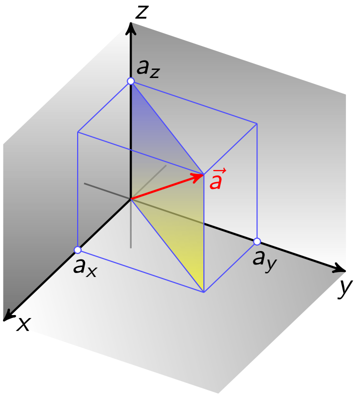

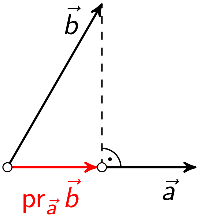

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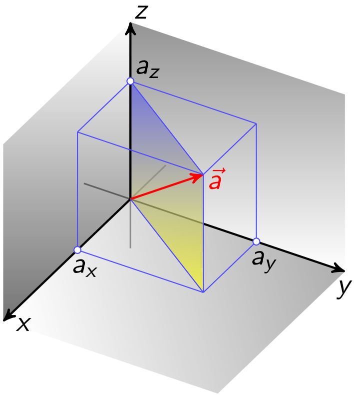

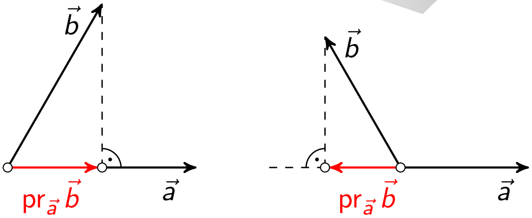

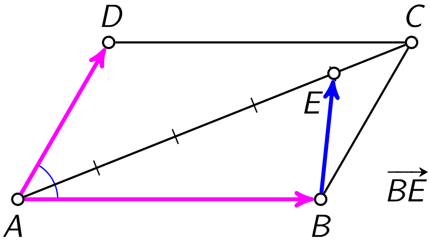

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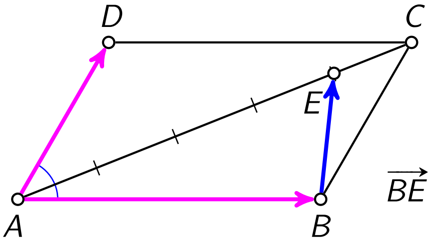

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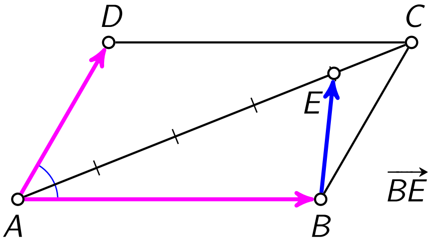

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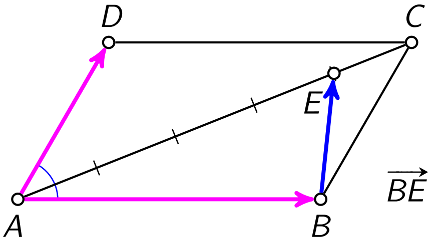

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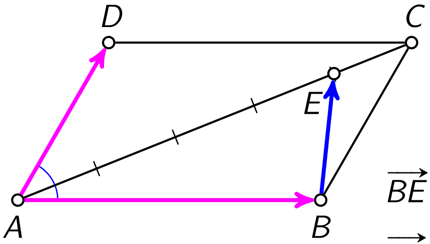

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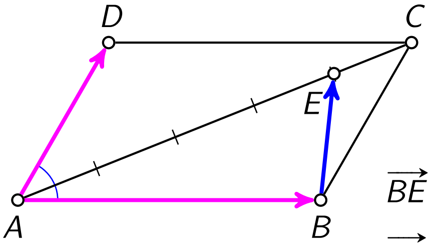

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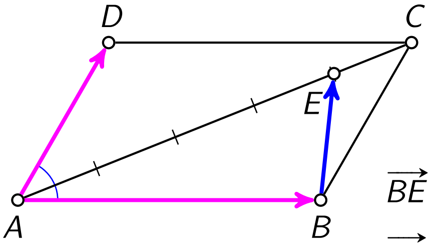

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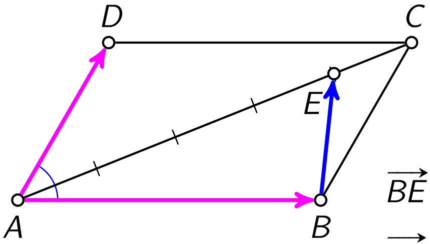

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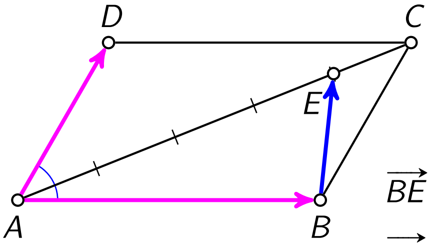

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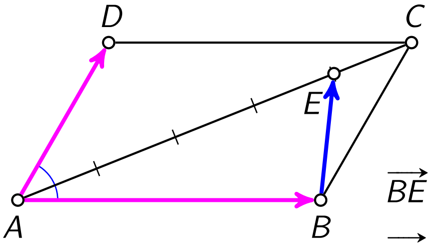

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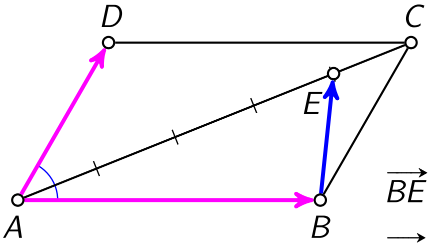

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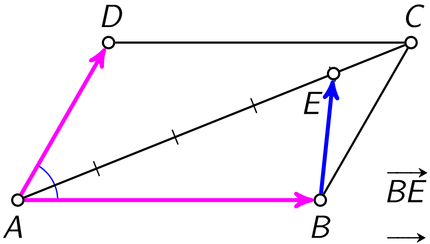

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$$\overrightarrow{BE} = -\frac{1}{5}\overrightarrow{AB} + \frac{4}{5}\overrightarrow{AD} \qquad \overrightarrow{AB} \cdot \overrightarrow{AD} = \frac{15}{2}$$

$$\overrightarrow{BA} = -1 \cdot \overrightarrow{AB} + 0 \cdot \overrightarrow{AD}$$

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$$\overrightarrow{BE} \cdot \overrightarrow{BA} = \left(-\frac{1}{5}\overrightarrow{AB} + \frac{4}{5}\overrightarrow{AD}\right) \cdot \left(-\overrightarrow{AB}\right) = \frac{1}{5}\overrightarrow{AB}^{\,2} - \frac{4}{5}\overrightarrow{AB} \cdot \overrightarrow{AD} =$$

$$= \frac{1}{5}\left|\overrightarrow{AB}\right|^2 - \frac{4}{5}\overrightarrow{AB} \cdot \overrightarrow{AD} = \frac{1}{5} \cdot 5^2 - \frac{4}{5} \cdot \frac{15}{2} = -1$$

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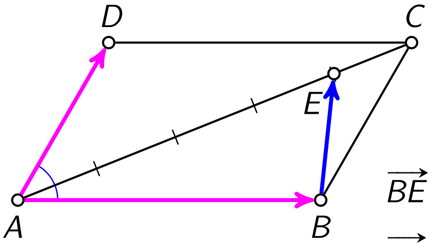

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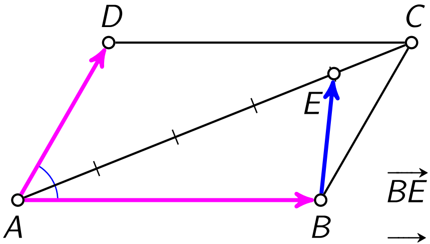

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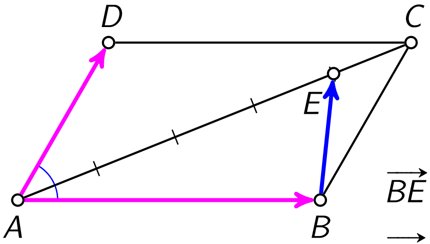

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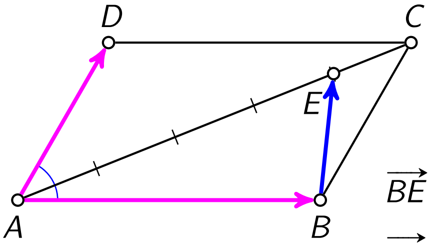

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Baza $\mathcal{B}$ nije ortonormirana!

Vektorski produkt vektora

$$\left|\vec{a} \times \vec{b}\right| = |\vec{a}| \cdot |\vec{b}| \cdot \sin\left(\vec{a}, \vec{b}\right)$$

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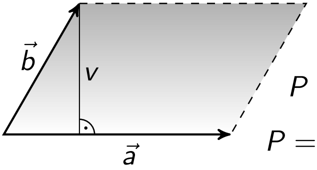
Površina paralelograma



$$P = |\vec{a}| \cdot v$$

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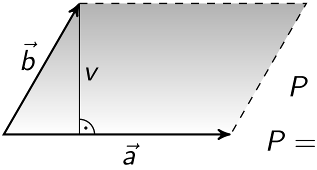
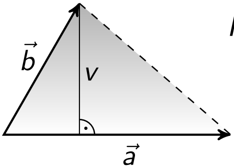


$$P = |\vec{a}|\cdot v$$

$$P = \left|\vec{a}\times\vec{b}\right|$$

Površina trokuta



$$P = \frac{1}{2}\left|\vec{a}\times\vec{b}\right|$$

$$P = \frac{1}{2}|\vec{a}|\cdot v$$

Mješoviti produkt vektora

$$(\vec{a}, \vec{b}, \vec{c}) = (\vec{a} \times \vec{b}) \cdot \vec{c}$$

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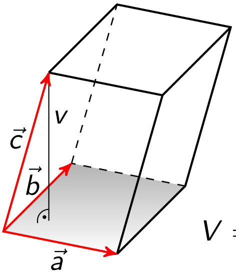
Volumen paralelepipeda



$$B = |\vec{a} \times \vec{b}|$$

$$V = B \cdot v$$

$$V = |(\vec{a}, \vec{b}, \vec{c})|$$

Mješoviti produkt vektora

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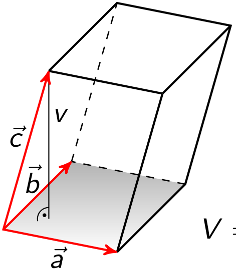

$$B = |\vec{a} \times \vec{b}|$$

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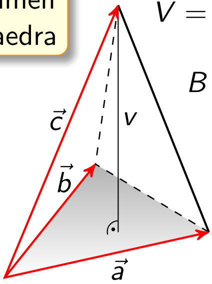
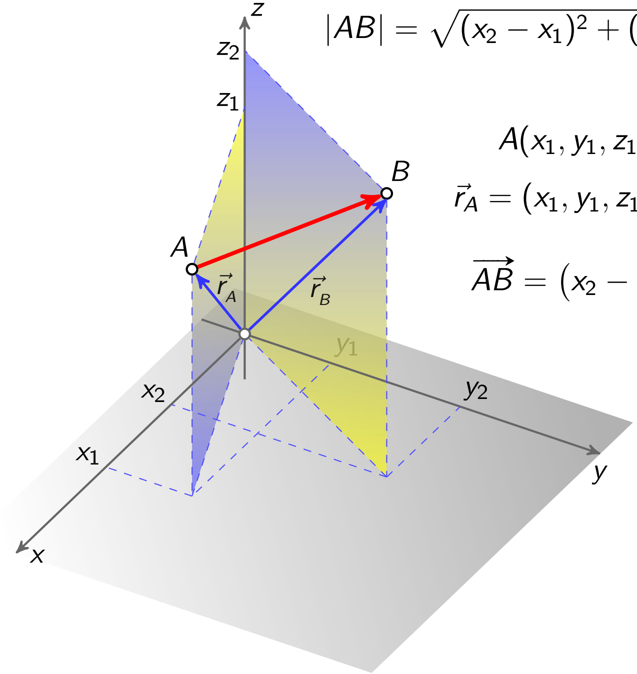
Volumen tetraedra



$$V = \frac{1}{6}|(\vec{a}, \vec{b}, \vec{c})|$$

$$B = \frac{1}{2}|\vec{a} \times \vec{b}|$$

$$V = \frac{1}{3}B \cdot v$$



$$|AB| = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2 + (z_2 - z_1)^2}$$

$$A(x_1, y_1, z_1) \qquad B(x_2, y_2, z_2)$$

$$\vec{r}_A = (x_1, y_1, z_1) \qquad \vec{r}_B = (x_2, y_2, z_2)$$

$$\overrightarrow{AB} = \left(x_2 - x_1,\ y_2 - y_1,\ z_2 - z_1\right)$$

$$\overrightarrow{AB} = \vec{r}_B - \vec{r}_A$$

prvi zadatak

Zadatak 1

Zadane su točke $A(2,3,-1)$, $B(3,4,2)$ *i* $C(1,0,-5)$.

a) *Odredite točku* D *tako da četverokut* $ABCD$ *bude paralelogram.*

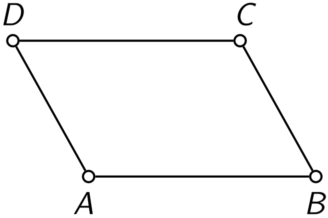
b) *Odredite unutarnji kut paralelograma* $ABCD$ *pri vrhu* A.

c) *Izračunajte površinu paralelograma* $ABCD$ *i duljinu visine paralelograma na stranicu* $\overline{AB}$.

d) *Ispitajte je li vektor* $\vec{v} = (1,2,-1)$ *paralelan s ravninom paralelograma* $ABCD$.

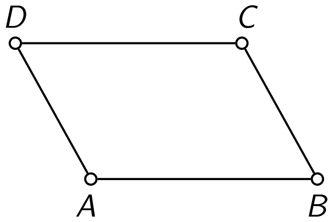
e) *Odredite ortogonalnu projekciju vektora* $\vec{v}$ *na ravninu paralelograma* $ABCD$.

Rješenje



Rješenje

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



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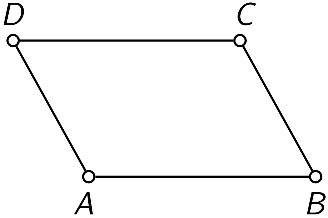
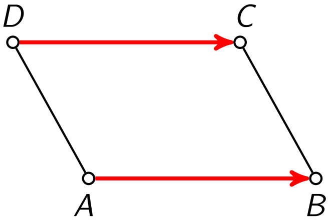


a)

Rješenje

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



a)

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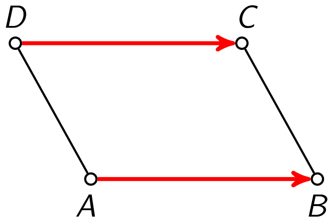
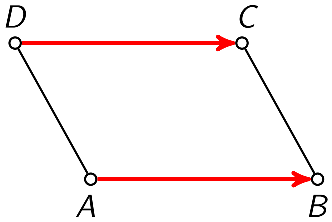


a) $\overrightarrow{AB} = \overrightarrow{DC}$

Rješenje

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

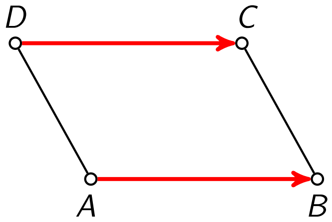


a) $$\overrightarrow{AB} = \overrightarrow{DC}$$

$$\vec{r}_B - \vec{r}_A$$

Rješenje

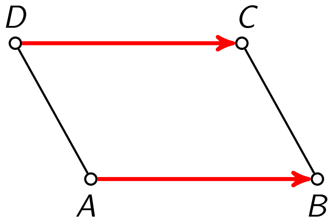
$A(2,3,-1), \quad B(3,4,2), \quad C(1,0,-5)$



a)
$$\overrightarrow{AB} = \overrightarrow{DC}$$
$$\vec{r}_B - \vec{r}_A =$$

Rješenje

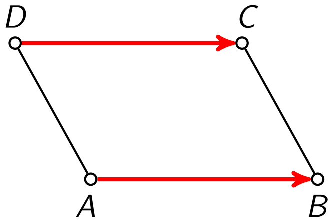
$$A(2, 3, -1), \quad B(3, 4, 2), \quad C(1, 0, -5)$$



a)
$$\overrightarrow{AB} = \overrightarrow{DC}$$
$$\vec{r}_B - \vec{r}_A = \vec{r}_C - \vec{r}_D$$

Rješenje

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



a)

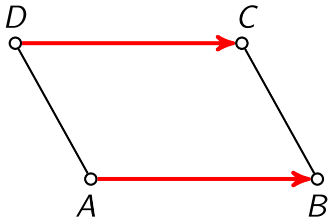
$$\overrightarrow{AB} = \overrightarrow{DC}$$

$$\vec{r}_B - \vec{r}_A = \vec{r}_C - \vec{r}_D$$

$$\vec{r}_D =$$

Rješenje

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



a)

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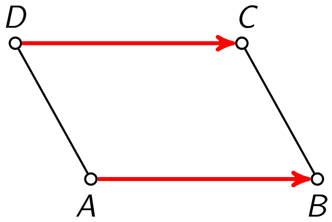
$$\vec{r}_D = \vec{r}_A$$

Rješenje

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



a)

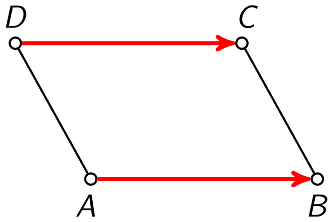
$$\overrightarrow{AB} = \overrightarrow{DC}$$

$$\vec{r}_B - \vec{r}_A = \vec{r}_C - \vec{r}_D$$

$$\vec{r}_D = \vec{r}_A - \vec{r}_B$$

Rješenje

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



a)

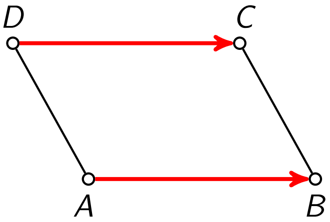
$$\overrightarrow{AB} = \overrightarrow{DC}$$

$$\vec{r}_B - \vec{r}_A = \vec{r}_C - \vec{r}_D$$

$$\vec{r}_D = \vec{r}_A - \vec{r}_B + \vec{r}_C$$

Rješenje

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



a)

$$\overrightarrow{AB} = \overrightarrow{DC}$$

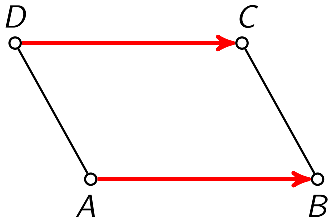
$$\vec{r}_B - \vec{r}_A = \vec{r}_C - \vec{r}_D$$

$$\vec{r}_D = \vec{r}_A - \vec{r}_B + \vec{r}_C$$

$\vec{r}_D =$

Rješenje

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



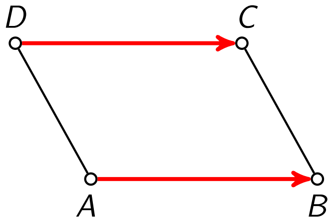
a)

$$\overrightarrow{AB} = \overrightarrow{DC}$$
$$\vec{r}_B - \vec{r}_A = \vec{r}_C - \vec{r}_D$$
$$\vec{r}_D = \vec{r}_A - \vec{r}_B + \vec{r}_C$$

$\vec{r}_D = (2,3,-1)$

Rješenje

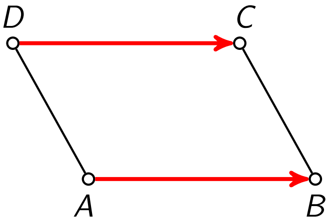
$$A(2,3,-1),\quad B(3,4,2),\quad C(1,0,-5)$$



a)
$$\overrightarrow{AB} = \overrightarrow{DC}$$
$$\vec{r}_B - \vec{r}_A = \vec{r}_C - \vec{r}_D$$
$$\vec{r}_D = \vec{r}_A - \vec{r}_B + \vec{r}_C$$
$$\vec{r}_D = (2,3,-1) - (3,4,2)$$

Rješenje

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



a)

$$\overrightarrow{AB} = \overrightarrow{DC}$$

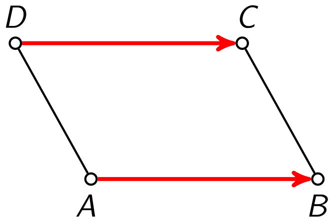
$$\vec{r}_B - \vec{r}_A = \vec{r}_C - \vec{r}_D$$

$$\vec{r}_D = \vec{r}_A - \vec{r}_B + \vec{r}_C$$

$$\vec{r}_D = (2,3,-1) - (3,4,2) + (1,0,-5)$$

Rješenje

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



a)

$$\overrightarrow{AB} = \overrightarrow{DC}$$

$$\vec{r}_B - \vec{r}_A = \vec{r}_C - \vec{r}_D$$

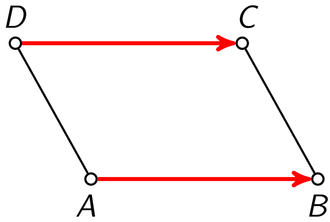
$$\vec{r}_D = \vec{r}_A - \vec{r}_B + \vec{r}_C$$

$$\vec{r}_D = (2,3,-1) - (3,4,2) + (1,0,-5)$$

$$\vec{r}_D =$$

Rješenje

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



a)

$$\overrightarrow{AB} = \overrightarrow{DC}$$

$$\vec{r}_B - \vec{r}_A = \vec{r}_C - \vec{r}_D$$

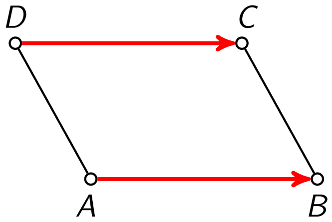
$$\vec{r}_D = \vec{r}_A - \vec{r}_B + \vec{r}_C$$

$$\vec{r}_D = (2,3,-1) - (3,4,2) + (1,0,-5)$$

$$\vec{r}_D = (0,$$

Rješenje

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



a)

$$\overrightarrow{AB} = \overrightarrow{DC}$$

$$\vec{r}_B - \vec{r}_A = \vec{r}_C - \vec{r}_D$$

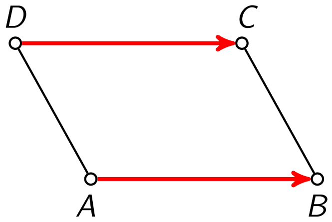
$$\vec{r}_D = \vec{r}_A - \vec{r}_B + \vec{r}_C$$

$$\vec{r}_D = (2, 3, -1) - (3, 4, 2) + (1, 0, -5)$$

$$\vec{r}_D = (0, -1,$$

Rješenje

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



a)

$$\overrightarrow{AB} = \overrightarrow{DC}$$

$$\vec{r}_B - \vec{r}_A = \vec{r}_C - \vec{r}_D$$

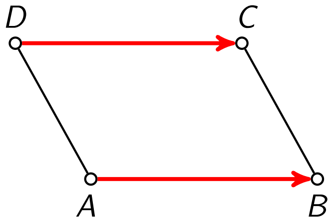
$$\vec{r}_D = \vec{r}_A - \vec{r}_B + \vec{r}_C$$

$$\vec{r}_D = (2, 3, -1) - (3, 4, 2) + (1, 0, -5)$$

$$\vec{r}_D = (0, -1, -8)$$

Rješenje

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



a)

$$\overrightarrow{AB} = \overrightarrow{DC}$$

$$\vec{r}_B - \vec{r}_A = \vec{r}_C - \vec{r}_D$$

$$\vec{r}_D = \vec{r}_A - \vec{r}_B + \vec{r}_C$$

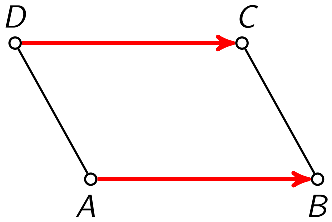
$$\vec{r}_D = (2,3,-1) - (3,4,2) + (1,0,-5)$$

$$\vec{r}_D = (0,-1,-8)$$

$$D(0,-1,-8)$$

Rješenje

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



a)

$$\overrightarrow{AB} = \overrightarrow{DC}$$

$$\vec{r}_B - \vec{r}_A = \vec{r}_C - \vec{r}_D$$

$$\vec{r}_D = \vec{r}_A - \vec{r}_B + \vec{r}_C$$

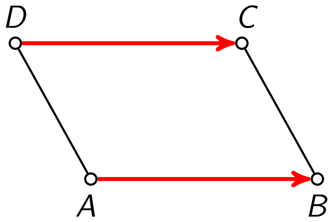
$$\vec{r}_D = (2,3,-1) - (3,4,2) + (1,0,-5)$$

$$\vec{r}_D = (0,-1,-8)$$

$$\boxed{D(0,-1,-8)}$$

Rješenje

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



a)

$$\overrightarrow{AB} = \overrightarrow{DC}$$

$$\vec{r}_B - \vec{r}_A = \vec{r}_C - \vec{r}_D$$

$$\vec{r}_D = \vec{r}_A - \vec{r}_B + \vec{r}_C$$

$$\vec{r}_D = (2,3,-1) - (3,4,2) + (1,0,-5)$$

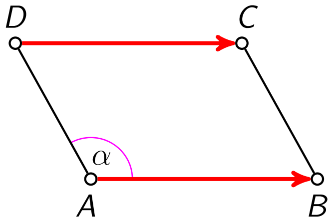
$$\vec{r}_D = (0,-1,-8)$$

$$\boxed{D(0,-1,-8)}$$

b)

Rješenje

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



a)

$$\overrightarrow{AB} = \overrightarrow{DC}$$

$$\vec{r}_B - \vec{r}_A = \vec{r}_C - \vec{r}_D$$

$$\vec{r}_D = \vec{r}_A - \vec{r}_B + \vec{r}_C$$

$$\vec{r}_D = (2,3,-1) - (3,4,2) + (1,0,-5)$$

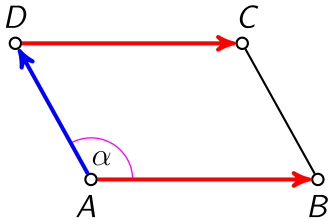
$$\vec{r}_D = (0,-1,-8)$$

$$\boxed{D(0,-1,-8)}$$

b)

Rješenje

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



a)

$$\overrightarrow{AB} = \overrightarrow{DC}$$

$$\vec{r}_B - \vec{r}_A = \vec{r}_C - \vec{r}_D$$

$$\vec{r}_D = \vec{r}_A - \vec{r}_B + \vec{r}_C$$

$$\vec{r}_D = (2,3,-1) - (3,4,2) + (1,0,-5)$$

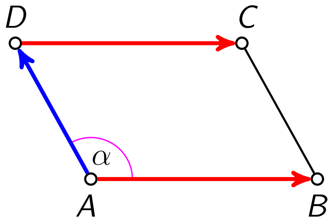
$$\vec{r}_D = (0,-1,-8)$$

$$\boxed{D(0,-1,-8)}$$

b)

Rješenje

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



a)

$$\overrightarrow{AB} = \overrightarrow{DC}$$

$$\vec{r}_B - \vec{r}_A = \vec{r}_C - \vec{r}_D$$

$$\vec{r}_D = \vec{r}_A - \vec{r}_B + \vec{r}_C$$

$$\vec{r}_D = (2,3,-1) - (3,4,2) + (1,0,-5)$$

$$\vec{r}_D = (0,-1,-8)$$

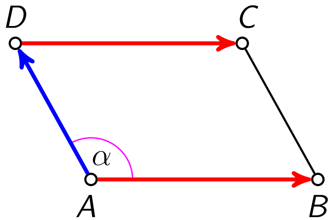
$$\boxed{D(0,-1,-8)}$$

b)

$$\alpha = \sphericalangle\left(\overrightarrow{AB}, \overrightarrow{AD}\right)$$

Rješenje

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



a)

$$\overrightarrow{AB} = \overrightarrow{DC}$$

$$\vec{r}_B - \vec{r}_A = \vec{r}_C - \vec{r}_D$$

$$\vec{r}_D = \vec{r}_A - \vec{r}_B + \vec{r}_C$$

$$\vec{r}_D = (2,3,-1) - (3,4,2) + (1,0,-5)$$

$$\vec{r}_D = (0,-1,-8)$$

$$\boxed{D(0,-1,-8)}$$

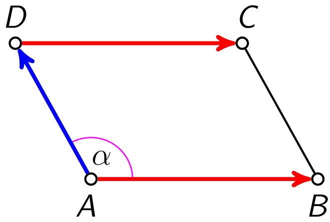
b)

$$\alpha = \sphericalangle\left(\overrightarrow{AB}, \overrightarrow{AD}\right)$$

$$\cos\alpha =$$

Rješenje

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



a)

$$\overrightarrow{AB} = \overrightarrow{DC}$$

$$\vec{r}_B - \vec{r}_A = \vec{r}_C - \vec{r}_D$$

$$\vec{r}_D = \vec{r}_A - \vec{r}_B + \vec{r}_C$$

$$\vec{r}_D = (2,3,-1) - (3,4,2) + (1,0,-5)$$

$$\vec{r}_D = (0,-1,-8)$$

$$\boxed{D(0,-1,-8)}$$

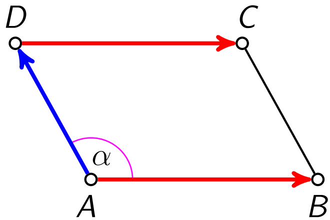
b)

$$\alpha = \sphericalangle\left(\overrightarrow{AB}, \overrightarrow{AD}\right)$$

$$\cos\alpha = \underline{\qquad\qquad}$$

Rješenje

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



a)

$$\overrightarrow{AB} = \overrightarrow{DC}$$

$$\vec{r}_B - \vec{r}_A = \vec{r}_C - \vec{r}_D$$

$$\vec{r}_D = \vec{r}_A - \vec{r}_B + \vec{r}_C$$

$$\vec{r}_D = (2,3,-1) - (3,4,2) + (1,0,-5)$$

$$\vec{r}_D = (0,-1,-8)$$

$$\boxed{D(0,-1,-8)}$$

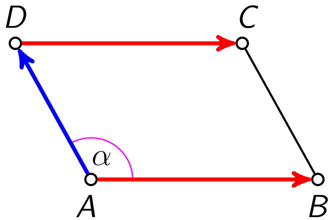
b)

$$\alpha = \sphericalangle(\overrightarrow{AB}, \overrightarrow{AD})$$

$$\cos\alpha = \frac{\overrightarrow{AB} \cdot \overrightarrow{AD}}{}$$

Rješenje

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



a)

$$\overrightarrow{AB} = \overrightarrow{DC}$$

$$\vec{r}_B - \vec{r}_A = \vec{r}_C - \vec{r}_D$$

$$\vec{r}_D = \vec{r}_A - \vec{r}_B + \vec{r}_C$$

$$\vec{r}_D = (2,3,-1) - (3,4,2) + (1,0,-5)$$

$$\vec{r}_D = (0,-1,-8)$$

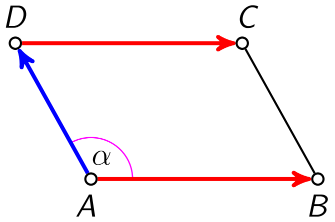
$$\boxed{D(0,-1,-8)}$$

b)

$$\alpha = \sphericalangle\left(\overrightarrow{AB}, \overrightarrow{AD}\right)$$

$$\cos\alpha = \frac{\overrightarrow{AB} \cdot \overrightarrow{AD}}{\left|\overrightarrow{AB}\right| \cdot \left|\overrightarrow{AD}\right|}$$

Rješenje



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

$$\overrightarrow{AB} =$$

a)

$$\overrightarrow{AB} = \overrightarrow{DC}$$

$$\vec{r}_B - \vec{r}_A = \vec{r}_C - \vec{r}_D$$

$$\vec{r}_D = \vec{r}_A - \vec{r}_B + \vec{r}_C$$

$$\vec{r}_D = (2,3,-1) - (3,4,2) + (1,0,-5)$$

$$\vec{r}_D = (0,-1,-8)$$

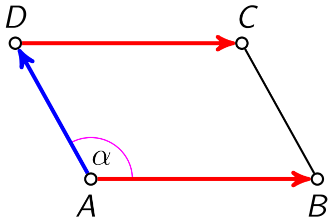
$$\boxed{D(0,-1,-8)}$$

b)

$$\alpha = \sphericalangle\left(\overrightarrow{AB}, \overrightarrow{AD}\right)$$

$$\cos\alpha = \frac{\overrightarrow{AB}\cdot\overrightarrow{AD}}{\left|\overrightarrow{AB}\right|\cdot\left|\overrightarrow{AD}\right|}$$

Rješenje



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

$\overrightarrow{AB} = (1,$

a)

$$\overrightarrow{AB} = \overrightarrow{DC}$$

$$\vec{r}_B - \vec{r}_A = \vec{r}_C - \vec{r}_D$$

$$\vec{r}_D = \vec{r}_A - \vec{r}_B + \vec{r}_C$$

$$\vec{r}_D = (2,3,-1) - (3,4,2) + (1,0,-5)$$

$$\vec{r}_D = (0,-1,-8)$$

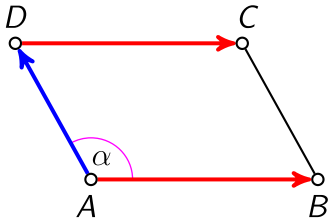
$$\boxed{D(0,-1,-8)}$$

b)

$$\alpha = \sphericalangle\left(\overrightarrow{AB}, \overrightarrow{AD}\right)$$

$$\cos\alpha = \frac{\overrightarrow{AB} \cdot \overrightarrow{AD}}{\left|\overrightarrow{AB}\right| \cdot \left|\overrightarrow{AD}\right|}$$

Rješenje



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

$\overrightarrow{AB} = (1,1,$

a)

$$\overrightarrow{AB} = \overrightarrow{DC}$$

$$\vec{r}_B - \vec{r}_A = \vec{r}_C - \vec{r}_D$$

$$\vec{r}_D = \vec{r}_A - \vec{r}_B + \vec{r}_C$$

$$\vec{r}_D = (2,3,-1) - (3,4,2) + (1,0,-5)$$

$$\vec{r}_D = (0,-1,-8)$$

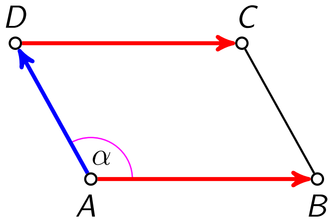
$$\boxed{D(0,-1,-8)}$$

b)

$$\alpha = \sphericalangle\left(\overrightarrow{AB}, \overrightarrow{AD}\right)$$

$$\cos\alpha = \frac{\overrightarrow{AB}\cdot\overrightarrow{AD}}{\left|\overrightarrow{AB}\right|\cdot\left|\overrightarrow{AD}\right|}$$

Rješenje



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

$$\overrightarrow{AB} = (1,1,3)$$

a)

$$\overrightarrow{AB} = \overrightarrow{DC}$$

$$\vec{r}_B - \vec{r}_A = \vec{r}_C - \vec{r}_D$$

$$\vec{r}_D = \vec{r}_A - \vec{r}_B + \vec{r}_C$$

$$\vec{r}_D = (2,3,-1) - (3,4,2) + (1,0,-5)$$

$$\vec{r}_D = (0,-1,-8)$$

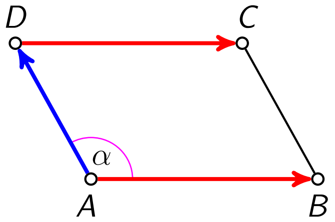
$$\boxed{D(0,-1,-8)}$$

b)

$$\alpha = \sphericalangle\left(\overrightarrow{AB}, \overrightarrow{AD}\right)$$

$$\cos\alpha = \frac{\overrightarrow{AB}\cdot\overrightarrow{AD}}{\left|\overrightarrow{AB}\right|\cdot\left|\overrightarrow{AD}\right|}$$

Rješenje



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

$$\overrightarrow{AB} = (1,1,3) \qquad \overrightarrow{AD} =$$

a)

$$\overrightarrow{AB} = \overrightarrow{DC}$$

$$\vec{r}_B - \vec{r}_A = \vec{r}_C - \vec{r}_D$$

$$\vec{r}_D = \vec{r}_A - \vec{r}_B + \vec{r}_C$$

$$\vec{r}_D = (2,3,-1) - (3,4,2) + (1,0,-5)$$

$$\vec{r}_D = (0,-1,-8)$$

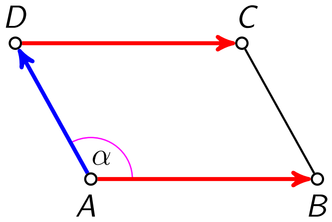
$$\boxed{D(0,-1,-8)}$$

b)

$$\alpha = \sphericalangle\left(\overrightarrow{AB}, \overrightarrow{AD}\right)$$

$$\cos\alpha = \frac{\overrightarrow{AB}\cdot\overrightarrow{AD}}{\left|\overrightarrow{AB}\right|\cdot\left|\overrightarrow{AD}\right|}$$

Rješenje



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

$$\overrightarrow{AB}=(1,1,3)\qquad \overrightarrow{AD}=(-2,$$

a)

$$\overrightarrow{AB}=\overrightarrow{DC}$$

$$\vec{r}_B-\vec{r}_A=\vec{r}_C-\vec{r}_D$$

$$\vec{r}_D=\vec{r}_A-\vec{r}_B+\vec{r}_C$$

$$\vec{r}_D=(2,3,-1)-(3,4,2)+(1,0,-5)$$

$$\vec{r}_D=(0,-1,-8)$$

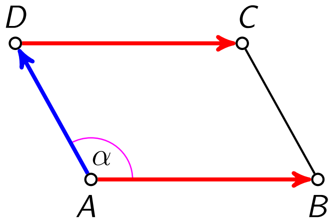
$$\boxed{D(0,-1,-8)}$$

b)

$$\alpha=\sphericalangle\left(\overrightarrow{AB},\overrightarrow{AD}\right)$$

$$\cos\alpha=\frac{\overrightarrow{AB}\cdot\overrightarrow{AD}}{\left|\overrightarrow{AB}\right|\cdot\left|\overrightarrow{AD}\right|}$$

Rješenje



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

$$\overrightarrow{AB}=(1,1,3)\qquad \overrightarrow{AD}=(-2,-4,$$

a)

$$\overrightarrow{AB}=\overrightarrow{DC}$$

$$\vec{r}_B-\vec{r}_A=\vec{r}_C-\vec{r}_D$$

$$\vec{r}_D=\vec{r}_A-\vec{r}_B+\vec{r}_C$$

$$\vec{r}_D=(2,3,-1)-(3,4,2)+(1,0,-5)$$

$$\vec{r}_D=(0,-1,-8)$$

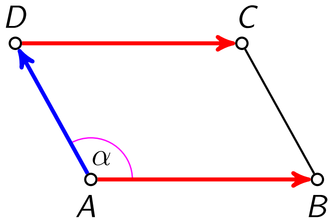
$$\boxed{D(0,-1,-8)}$$

b)

$$\alpha=\sphericalangle\left(\overrightarrow{AB},\overrightarrow{AD}\right)$$

$$\cos\alpha=\frac{\overrightarrow{AB}\cdot\overrightarrow{AD}}{\left|\overrightarrow{AB}\right|\cdot\left|\overrightarrow{AD}\right|}$$

Rješenje



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

$$\overrightarrow{AB}=(1,1,3)\qquad \overrightarrow{AD}=(-2,-4,-7)$$

a)

$$\overrightarrow{AB}=\overrightarrow{DC}$$

$$\vec{r}_B-\vec{r}_A=\vec{r}_C-\vec{r}_D$$

$$\vec{r}_D=\vec{r}_A-\vec{r}_B+\vec{r}_C$$

$$\vec{r}_D=(2,3,-1)-(3,4,2)+(1,0,-5)$$

$$\vec{r}_D=(0,-1,-8)$$

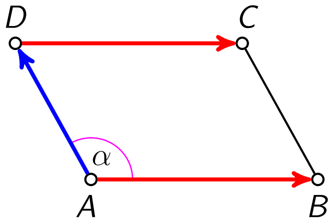
$$\boxed{D(0,-1,-8)}$$

b)

$$\alpha=\sphericalangle\left(\overrightarrow{AB},\overrightarrow{AD}\right)$$

$$\cos\alpha=\frac{\overrightarrow{AB}\cdot\overrightarrow{AD}}{\left|\overrightarrow{AB}\right|\cdot\left|\overrightarrow{AD}\right|}$$

Rješenje



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

$$\overrightarrow{AB}=(1,1,3)\qquad \overrightarrow{AD}=(-2,-4,-7)$$

a)

$$\overrightarrow{AB}=\overrightarrow{DC}$$

$$\vec{r}_B-\vec{r}_A=\vec{r}_C-\vec{r}_D$$

$$\vec{r}_D=\vec{r}_A-\vec{r}_B+\vec{r}_C$$

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$$\overrightarrow{AB}\cdot\overrightarrow{AD}=$$

Rješenje

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

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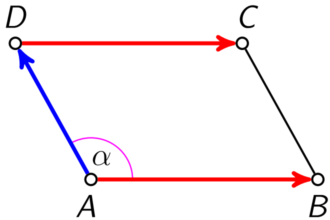

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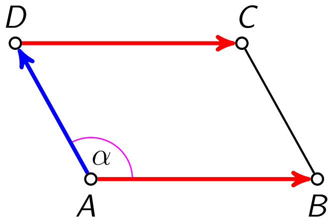
$$\overrightarrow{AB}\cdot\overrightarrow{AD} = 1\cdot(-2)$$

Rješenje



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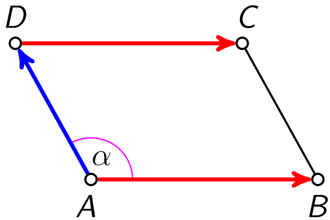
$$\overrightarrow{AB}\cdot\overrightarrow{AD} = 1\cdot(-2) + 1\cdot(-4)$$

Rješenje



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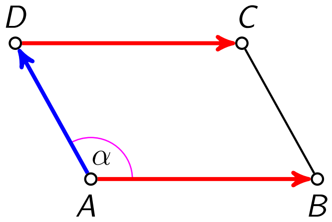
Rješenje



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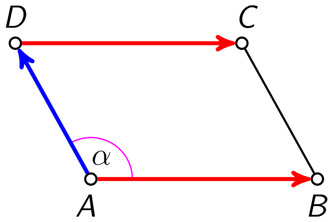
$$\overrightarrow{AB}\cdot\overrightarrow{AD} = 1\cdot(-2) + 1\cdot(-4) + 3\cdot(-7) = -27$$

Rješenje



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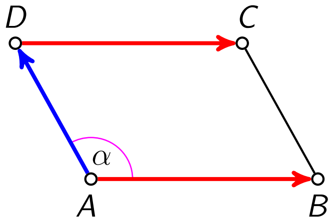
Rješenje



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$$\overrightarrow{AB}=(1,1,3)\qquad \overrightarrow{AD}=(-2,-4,-7)$$

$$\left|\overrightarrow{AD}\right|=\sqrt{}$$

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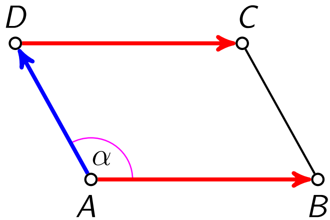
Rješenje



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$$\left|\overrightarrow{AD}\right|=\sqrt{(-2)^2}$$

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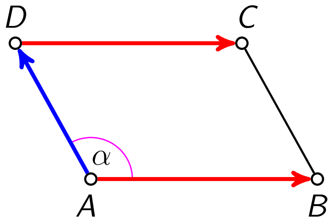

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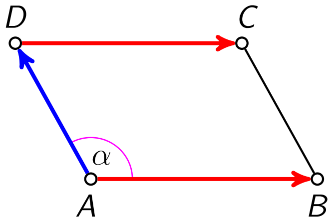
Rješenje



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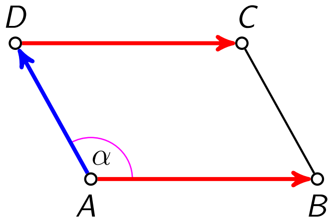

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$$\overrightarrow{AB} = (1,1,3) \qquad \overrightarrow{AD} = (-2,-4,-7)$$

$$\left|\overrightarrow{AD}\right| = \sqrt{(-2)^2+(-4)^2+(-7)^2} = \sqrt{69}$$

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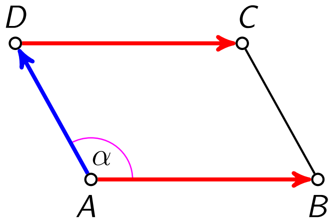

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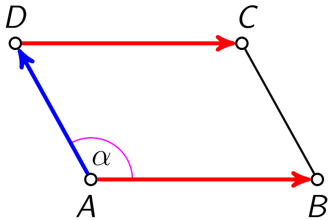
Rješenje



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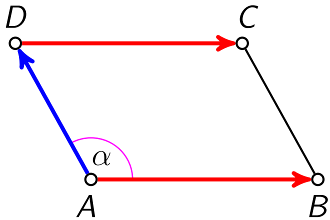
Rješenje



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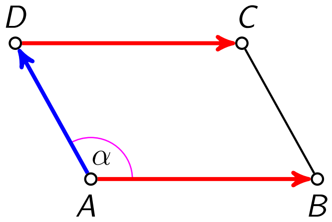
Rješenje



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$$|\overrightarrow{AB}| = \sqrt{1^2+1^2}$$

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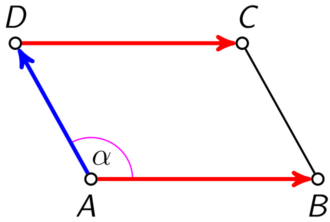
Rješenje



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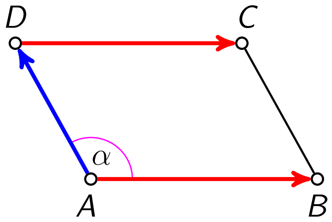
Rješenje



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$$\left|\overrightarrow{AB}\right| = \sqrt{1^2+1^2+3^2} = \sqrt{11}$$

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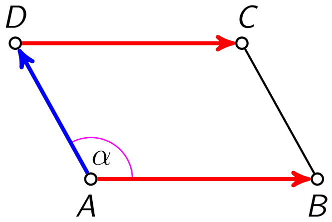
Rješenje



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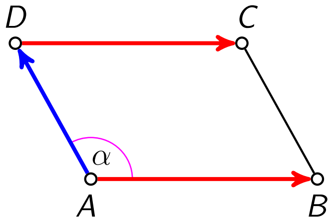
Rješenje



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$$|\overrightarrow{AD}| = \sqrt{(-2)^2+(-4)^2+(-7)^2} = \sqrt{69}$$

$$|\overrightarrow{AB}| = \sqrt{1^2+1^2+3^2} = \sqrt{11}$$

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$$\alpha = \sphericalangle(\overrightarrow{AB}, \overrightarrow{AD})$$

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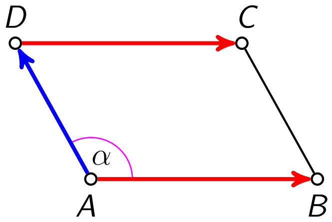
$$\cos\alpha = \underline{\qquad\qquad}$$

$$\overrightarrow{AB}\cdot\overrightarrow{AD} = 1\cdot(-2)+1\cdot(-4)+3\cdot(-7) = -27$$

Rješenje



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

$$\overrightarrow{AB} = (1,1,3) \qquad \overrightarrow{AD} = (-2,-4,-7)$$

$$|\overrightarrow{AD}| = \sqrt{(-2)^2+(-4)^2+(-7)^2} = \sqrt{69}$$

$$|\overrightarrow{AB}| = \sqrt{1^2+1^2+3^2} = \sqrt{11}$$

a)

$$\overrightarrow{AB} = \overrightarrow{DC}$$

$$\vec{r}_B - \vec{r}_A = \vec{r}_C - \vec{r}_D$$

$$\vec{r}_D = \vec{r}_A - \vec{r}_B + \vec{r}_C$$

$$\vec{r}_D = (2,3,-1) - (3,4,2) + (1,0,-5)$$

$$\vec{r}_D = (0,-1,-8)$$

$$\boxed{D(0,-1,-8)}$$

b)

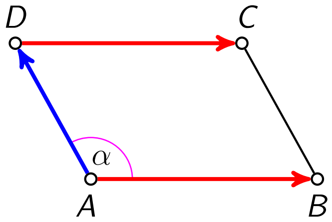
$$\alpha = \sphericalangle\left(\overrightarrow{AB}, \overrightarrow{AD}\right)$$

$$\cos\alpha = \frac{\overrightarrow{AB}\cdot\overrightarrow{AD}}{|\overrightarrow{AB}|\cdot|\overrightarrow{AD}|}$$

$$\cos\alpha = \frac{-27}{}$$

$$\overrightarrow{AB}\cdot\overrightarrow{AD} = 1\cdot(-2) + 1\cdot(-4) + 3\cdot(-7) = -27$$

Rješenje



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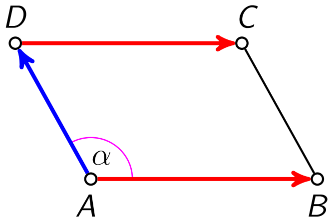
$$\cos\alpha = \frac{\overrightarrow{AB}\cdot\overrightarrow{AD}}{\left|\overrightarrow{AB}\right|\cdot\left|\overrightarrow{AD}\right|}$$

$$\cos\alpha = \frac{-27}{\sqrt{11}\cdot\sqrt{69}}$$

$$\overrightarrow{AB}\cdot\overrightarrow{AD} = 1\cdot(-2) + 1\cdot(-4) + 3\cdot(-7) = -27$$

Rješenje



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b)

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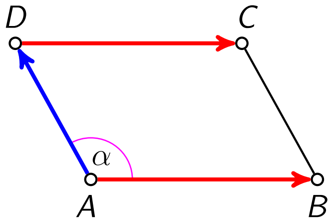
$$\cos\alpha=\frac{\overrightarrow{AB}\cdot\overrightarrow{AD}}{\left|\overrightarrow{AB}\right|\cdot\left|\overrightarrow{AD}\right|}$$

$$\cos\alpha=\frac{-27}{\sqrt{11}\cdot\sqrt{69}}$$

$$\alpha=$$

$$\overrightarrow{AB}\cdot\overrightarrow{AD}=1\cdot(-2)+1\cdot(-4)+3\cdot(-7)=-27$$

Rješenje



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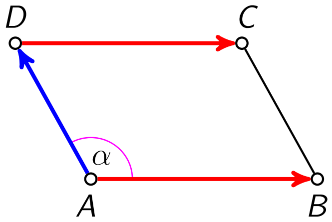
Rješenje



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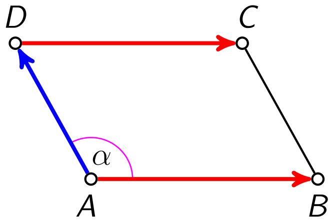
$$\alpha = \arccos\frac{-27}{\sqrt{11}\sqrt{69}}$$

$$\alpha = 168^\circ\, 31'\, 57''$$

$$\overrightarrow{AB}\cdot\overrightarrow{AD} = 1\cdot(-2) + 1\cdot(-4) + 3\cdot(-7) = -27$$

Rješenje



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$$\alpha=\sphericalangle\left(\overrightarrow{AB},\overrightarrow{AD}\right)$$

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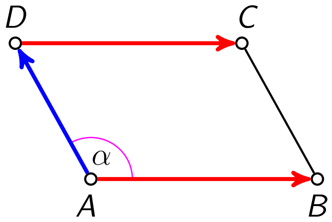
$$\alpha=\arccos\frac{-27}{\sqrt{11}\sqrt{69}}$$

$$\boxed{\alpha=168^\circ\,31'\,57''}$$

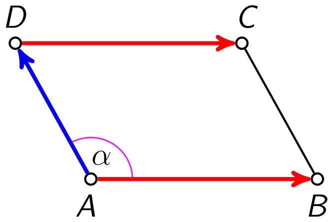
$$\overrightarrow{AB}\cdot\overrightarrow{AD}=1\cdot(-2)+1\cdot(-4)+3\cdot(-7)=-27$$



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

$$\overrightarrow{AB} = (1,1,3) \qquad \overrightarrow{AD} = (-2,-4,-7)$$

c)

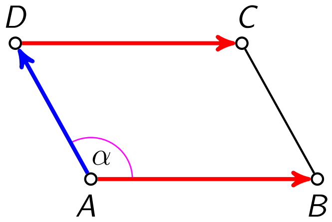


$$A(2,3,-1),\quad B(3,4,2),\quad C(1,0,-5)$$

$$\overrightarrow{AB} = (1,1,3) \qquad \overrightarrow{AD} = (-2,-4,-7)$$

$$P = |\overrightarrow{AB} \times \overrightarrow{AD}|$$

c)



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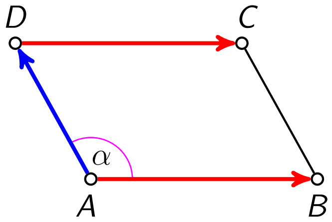
$$\overrightarrow{AB} \times \overrightarrow{AD} =$$



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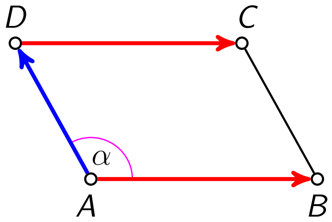
$$\overrightarrow{AB} \times \overrightarrow{AD} = \left| \qquad \qquad \right|$$



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

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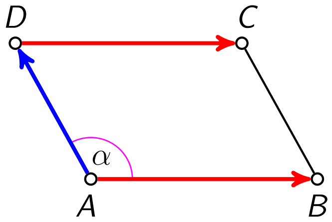
$$P=\left|\overrightarrow{AB}\times\overrightarrow{AD}\right|$$

c)

$$\overrightarrow{AB}\times\overrightarrow{AD}=\begin{vmatrix}\vec{i} & \vec{j} & \vec{k}\\ & & \\ & & \end{vmatrix}$$



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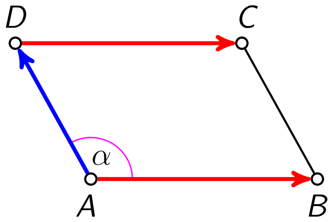

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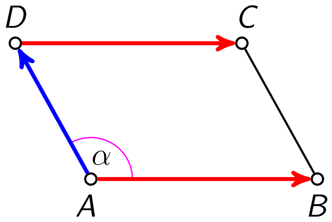

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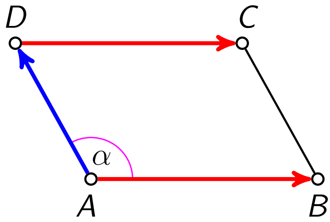
$$\overrightarrow{AB} \times \overrightarrow{AD} = \begin{vmatrix} \vec{i} & \vec{j} & \vec{k} \\ 1 & 1 & 3 \\ -2 & -4 & -7 \end{vmatrix} = \vec{i}\cdot$$

$$A_{ij} = (-1)^{i+j} M_{ij}$$



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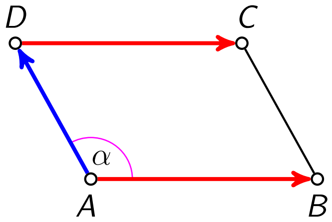

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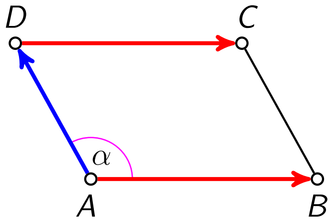

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$$+\,\vec{j}\,\cdot$$

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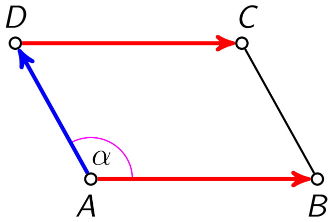

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$$+ \vec{j} \cdot (-1)^{1+2}$$

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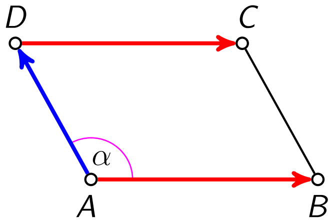

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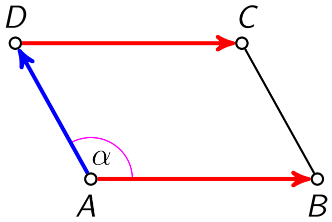
$A_{ij} = (-1)^{i+j} M_{ij}$



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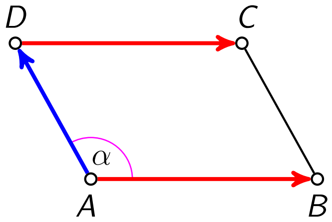
$$+ \vec{j} \cdot (-1)^{1+2} \begin{vmatrix} 1 & 3 \\ -2 & -7 \end{vmatrix} + \vec{k} \cdot$$

$$A_{ij} = (-1)^{i+j} M_{ij}$$



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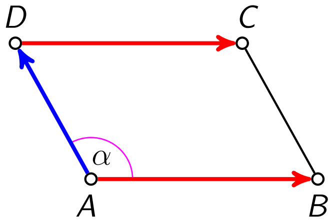

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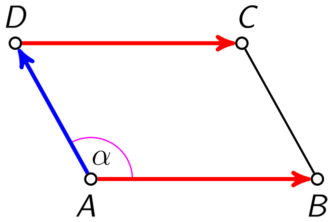

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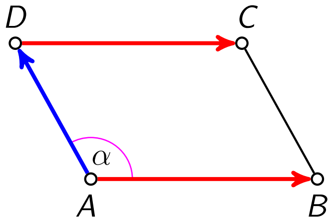
$$+ \vec{j} \cdot (-1)^{1+2} \begin{vmatrix} 1 & 3 \\ -2 & -7 \end{vmatrix} + \vec{k} \cdot (-1)^{1+3} \begin{vmatrix} 1 & 1 \\ -2 & -4 \end{vmatrix} =$$

$$= 5\vec{i}$$

$$A_{ij} = (-1)^{i+j} M_{ij}$$



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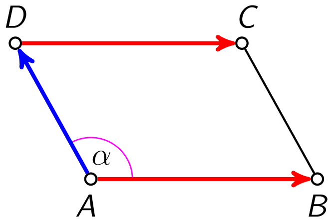
$$= 5\vec{i} + \vec{j}$$

$$A_{ij} = (-1)^{i+j} M_{ij}$$



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

$$\overrightarrow{AB} = (1,1,3) \qquad \overrightarrow{AD} = (-2,-4,-7)$$

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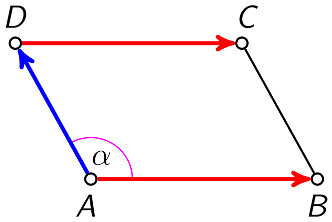

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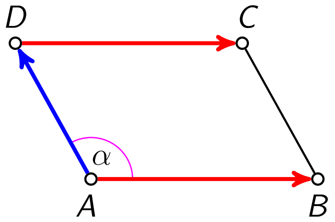

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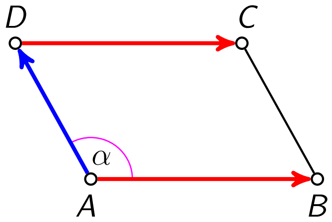

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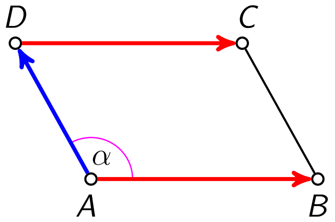

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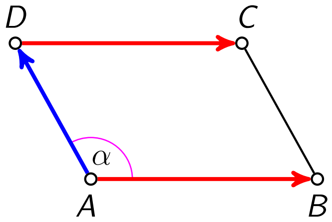

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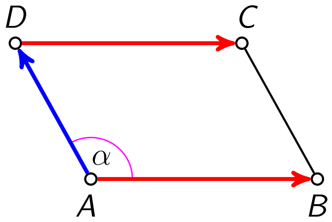

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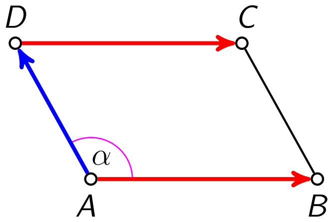

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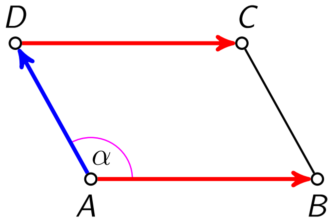

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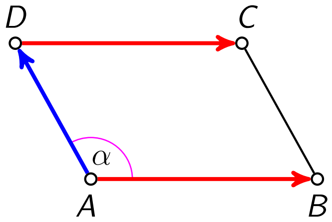

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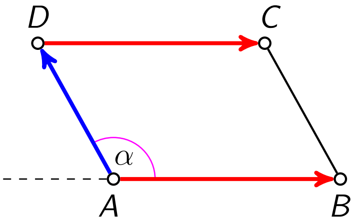

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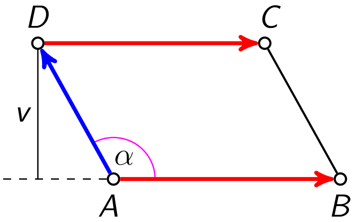

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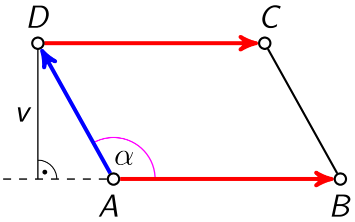

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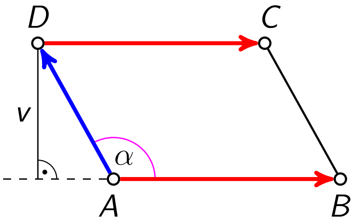

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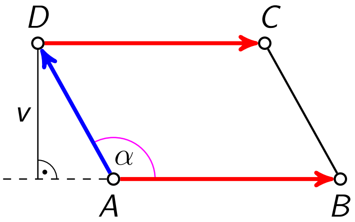

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$$\boxed{P=\sqrt{30}}$$

$$P=|\overrightarrow{AB}|\cdot v$$

$$v=\frac{P}{|\overrightarrow{AB}|}$$

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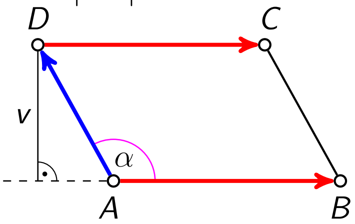

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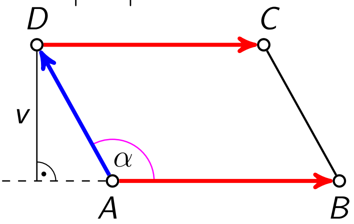

$\left|\overrightarrow{AB}\right| = \sqrt{11}$

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$$\boxed{P = \sqrt{30}}$$

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$v = \dfrac{P}{\left|\overrightarrow{AB}\right|}$

$v = \dfrac{\sqrt{30}}{\sqrt{11}}$

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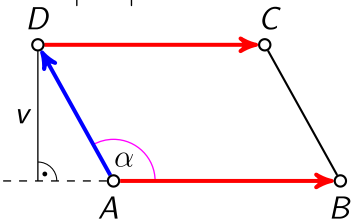

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$P = |\overrightarrow{AB}| \cdot v$

$v = \dfrac{P}{|\overrightarrow{AB}|}$

$$\boxed{v = \frac{\sqrt{30}}{\sqrt{11}}}$$

c)

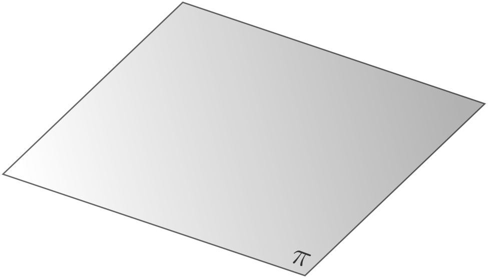
$$\overrightarrow{AB} \times \overrightarrow{AD} = \begin{vmatrix} \vec{i} & \vec{j} & \vec{k} \\ 1 & 1 & 3 \\ -2 & -4 & -7 \end{vmatrix} = \vec{i} \cdot (-1)^{1+1} \begin{vmatrix} 1 & 3 \\ -4 & -7 \end{vmatrix} +$$

$$+ \vec{j} \cdot (-1)^{1+2} \begin{vmatrix} 1 & 3 \\ -2 & -7 \end{vmatrix} + \vec{k} \cdot (-1)^{1+3} \begin{vmatrix} 1 & 1 \\ -2 & -4 \end{vmatrix} =$$

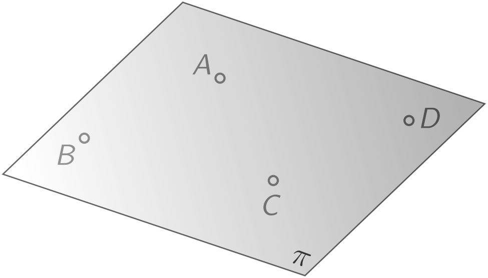
$$= 5\vec{i} + \vec{j} - 2\vec{k} = (5, 1, -2)$$

$$A_{ij} = (-1)^{i+j} M_{ij}$$

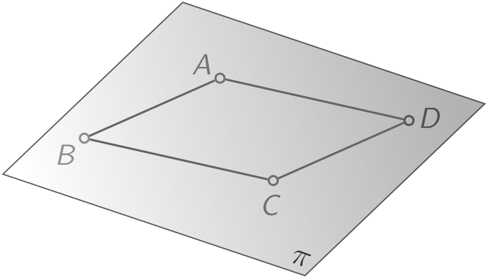
d)



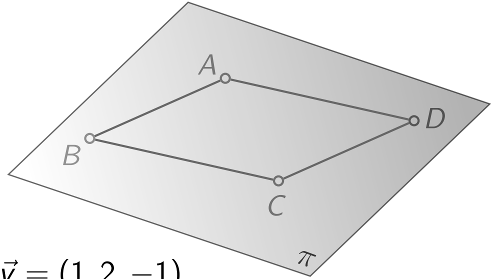
d)



d)

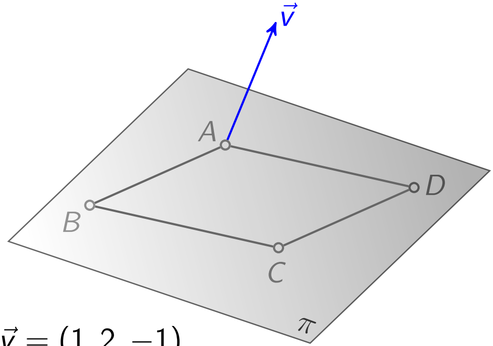


d)



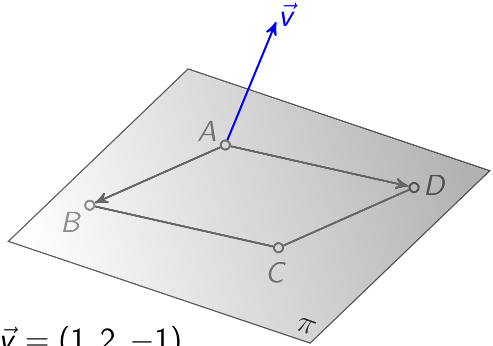
$\vec{v} = (1, 2, -1)$

d)



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

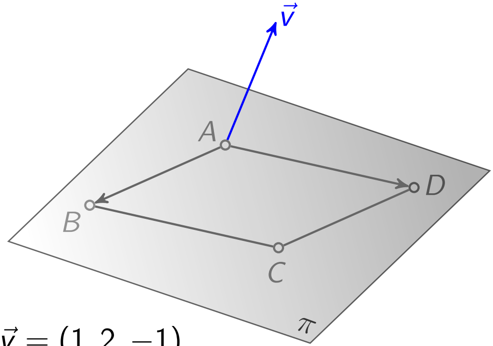
d)



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

d)

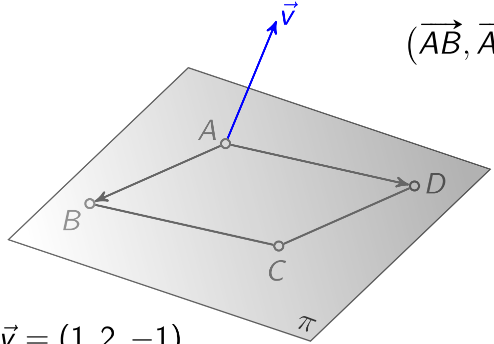
$\overrightarrow{AB} = (1, 1, 3) \qquad \overrightarrow{AD} = (-2, -4, -7)$



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

d)

$$\overrightarrow{AB} = (1, 1, 3) \qquad \overrightarrow{AD} = (-2, -4, -7)$$

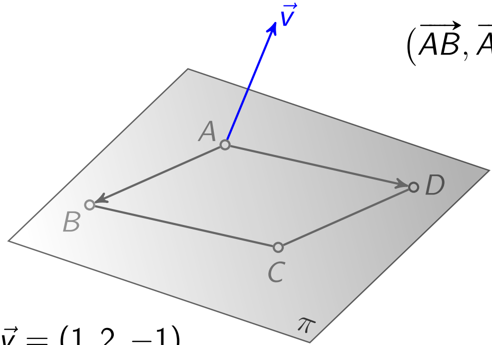


$$\left(\overrightarrow{AB}, \overrightarrow{AD}, \vec{v}\right) =$$

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

d)

$$\overrightarrow{AB} = (1, 1, 3) \qquad \overrightarrow{AD} = (-2, -4, -7)$$

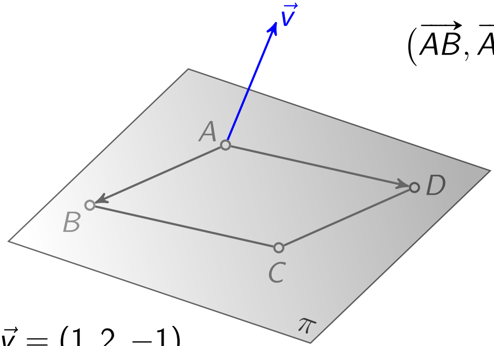


$$(\overrightarrow{AB}, \overrightarrow{AD}, \vec{v}) = \begin{vmatrix} & & \\ & & \\ & & \end{vmatrix}$$

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

d)

$\overrightarrow{AB} = (1, 1, 3)$ $\overrightarrow{AD} = (-2, -4, -7)$

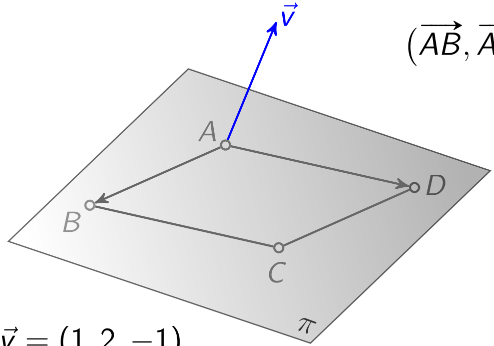


$$(\overrightarrow{AB}, \overrightarrow{AD}, \vec{v}) = \begin{vmatrix} 1 & 1 & 3 \\ & & \\ & & \end{vmatrix}$$

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

d)

$\overrightarrow{AB} = (1, 1, 3) \qquad \overrightarrow{AD} = (-2, -4, -7)$



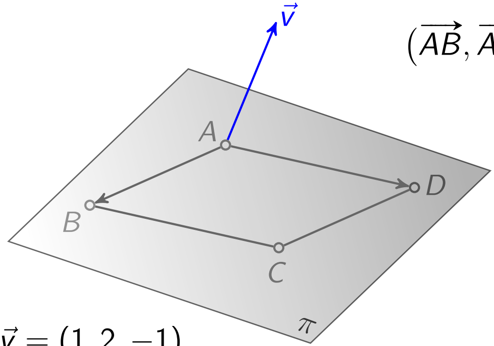
$\vec{v} = (1, 2, -1)$

$$\left(\overrightarrow{AB}, \overrightarrow{AD}, \vec{v}\right) = \begin{vmatrix} 1 & 1 & 3 \\ -2 & -4 & -7 \\ & & \end{vmatrix}$$

d)

$\overrightarrow{AB} = (1, 1, 3) \qquad \overrightarrow{AD} = (-2, -4, -7)$

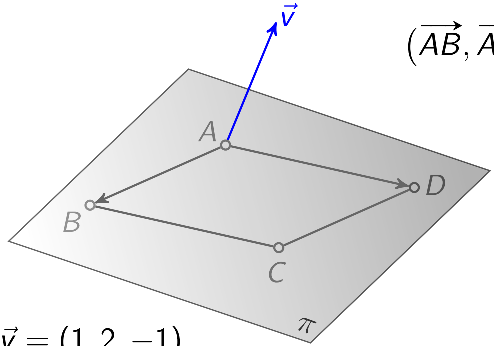
$$(\overrightarrow{AB}, \overrightarrow{AD}, \vec{v}) = \begin{vmatrix} 1 & 1 & 3 \\ -2 & -4 & -7 \\ 1 & 2 & -1 \end{vmatrix}$$



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

d)

$$\overrightarrow{AB} = (1,1,3) \qquad \overrightarrow{AD} = (-2,-4,-7)$$

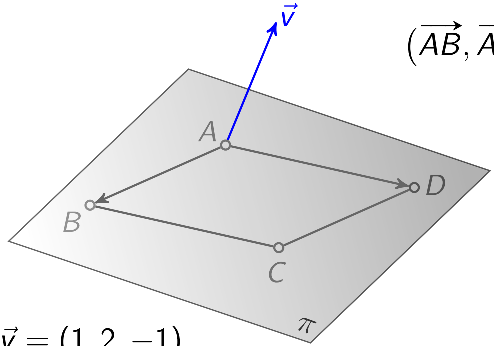


$$\left(\overrightarrow{AB}, \overrightarrow{AD}, \vec{v}\right) = \begin{vmatrix} 1 & 1 & 3 \\ -2 & -4 & -7 \\ 1 & 2 & -1 \end{vmatrix} = 9$$

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

d)

$$\overrightarrow{AB} = (1, 1, 3) \qquad \overrightarrow{AD} = (-2, -4, -7)$$

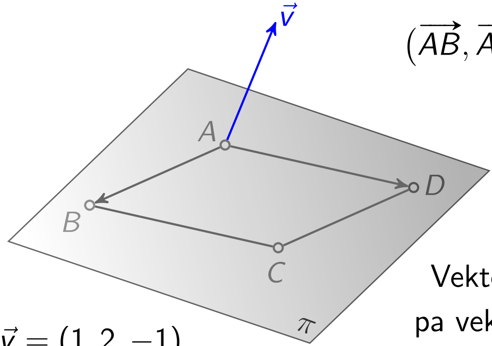


$$\left(\overrightarrow{AB}, \overrightarrow{AD}, \vec{v}\right) = \begin{vmatrix} 1 & 1 & 3 \\ -2 & -4 & -7 \\ 1 & 2 & -1 \end{vmatrix} = 9 \neq 0$$

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

d)

$$\overrightarrow{AB} = (1,1,3) \qquad \overrightarrow{AD} = (-2,-4,-7)$$

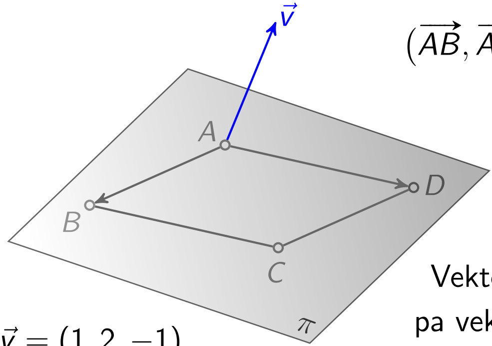


$$\left(\overrightarrow{AB}, \overrightarrow{AD}, \vec{v}\right) = \begin{vmatrix} 1 & 1 & 3 \\ -2 & -4 & -7 \\ 1 & 2 & -1 \end{vmatrix} = 9 \neq 0$$

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

Vektori $\overrightarrow{AB}, \overrightarrow{AD}$ i $\vec{v}$ su nekomplanarni pa vektor $\vec{v}$ nije paralelan s ravninom π.

d) $\overrightarrow{AB} = (1, 1, 3) \qquad \overrightarrow{AD} = (-2, -4, -7)$



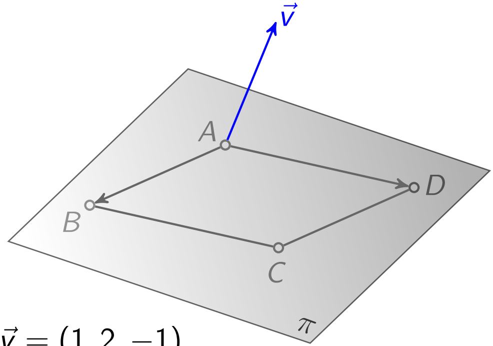
$\vec{v} = (1, 2, -1)$

$$\left(\overrightarrow{AB}, \overrightarrow{AD}, \vec{v}\right) = \begin{vmatrix} 1 & 1 & 3 \\ -2 & -4 & -7 \\ 1 & 2 & -1 \end{vmatrix} = 9 \neq 0$$

Vektori $\overrightarrow{AB}, \overrightarrow{AD}$ i $\vec{v}$ su nekomplanarni pa vektor $\vec{v}$ nije paralelan s ravninom π.

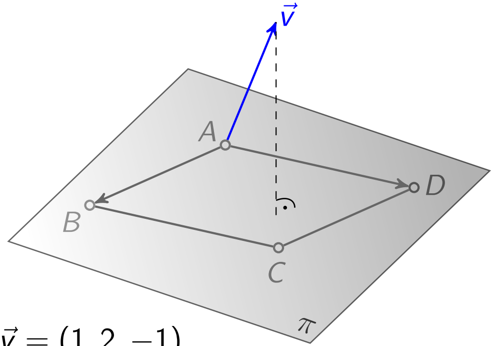
Kako je $\left(\overrightarrow{AB}, \overrightarrow{AD}, \vec{v}\right) > 0$, vektori $\overrightarrow{AB}, \overrightarrow{AD}$ i $\vec{v}$ u danom poretku čine jednu desnu bazu za V^3.

e)



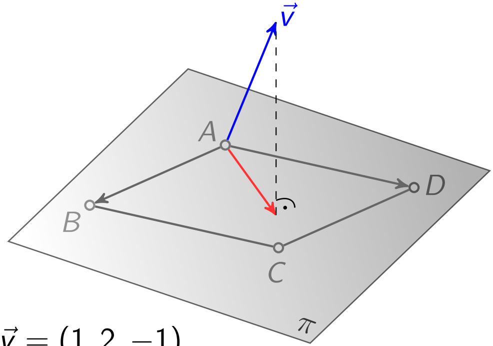
$\vec{v} = (1, 2, -1)$

e)



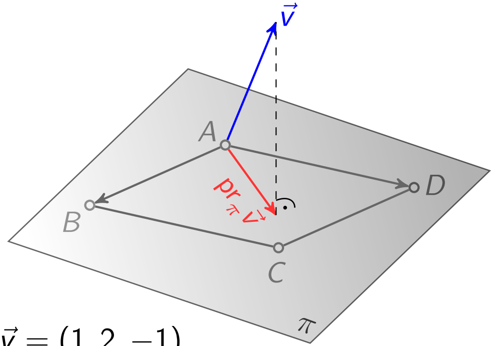
$\vec{v} = (1, 2, -1)$

e)



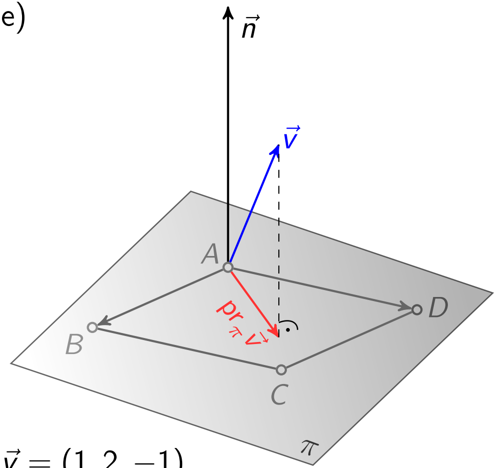
$\vec{v} = (1, 2, -1)$

e)



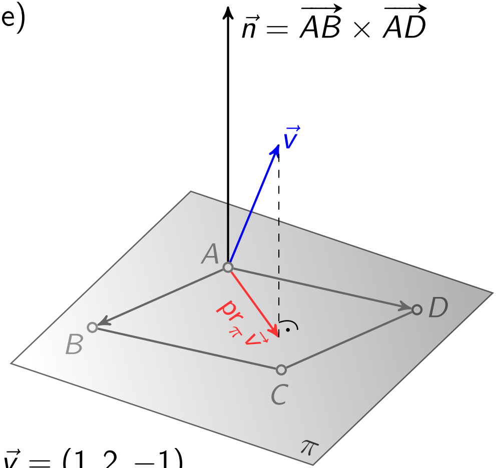
$\vec{v} = (1, 2, -1)$

e)



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

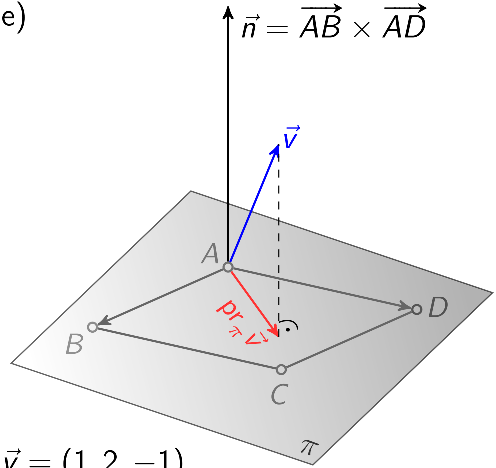
e)



$\vec{n} = \overrightarrow{AB} \times \overrightarrow{AD}$
$\vec{v}$
A
B
C
D
$pr_\pi \vec{v}$
π

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

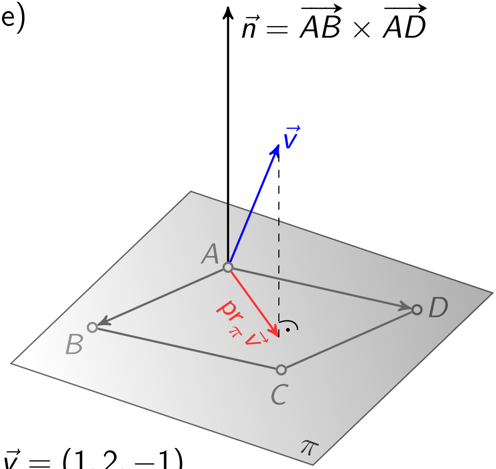
e)



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

$\vec{n} = (5, 1, -2)$

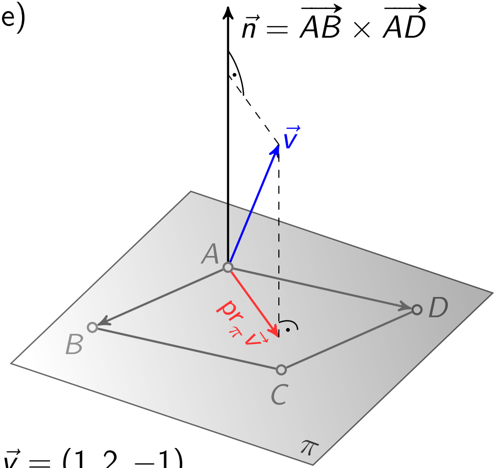
e)



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

$\vec{n} = (5, 1, -2) \qquad |\vec{n}| = \sqrt{30}$

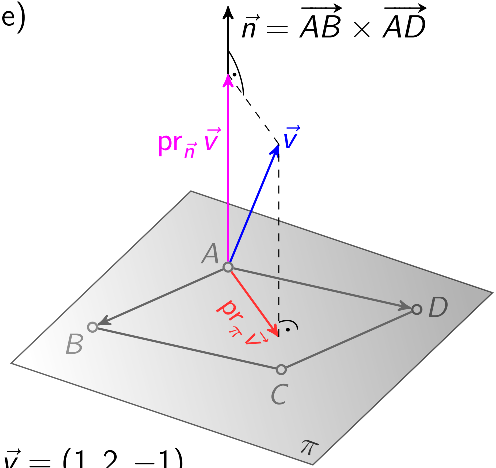
e)



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

$\vec{n} = (5, 1, -2) \qquad |\vec{n}| = \sqrt{30}$

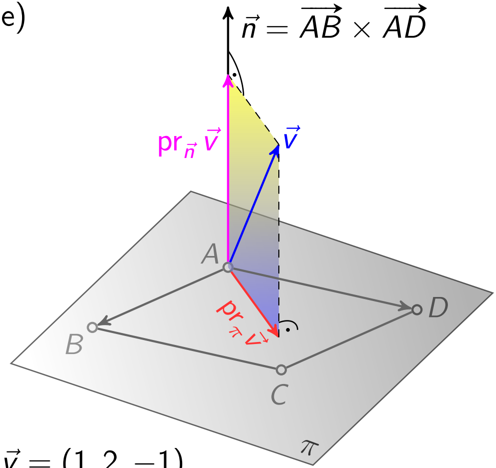
e)



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

$\vec{n} = (5, 1, -2) \qquad |\vec{n}| = \sqrt{30}$

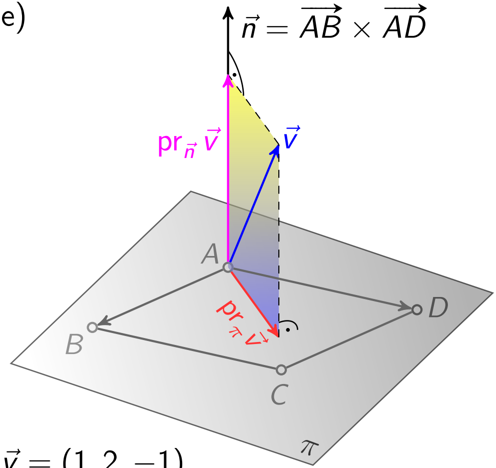
e)



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

$\vec{n} = (5, 1, -2) \qquad |\vec{n}| = \sqrt{30}$

e)

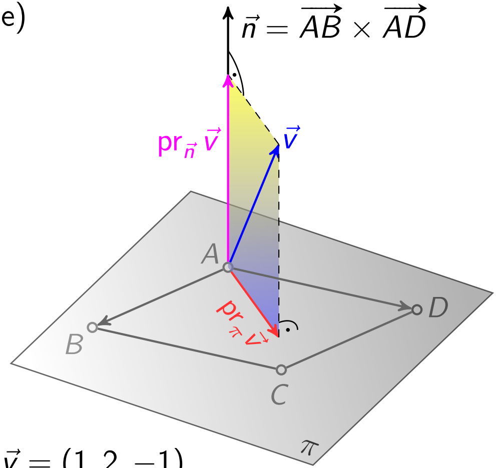


$$\vec{v} = \text{pr}_{\vec{n}}\, \vec{v} + \text{pr}_{\pi}\, \vec{v}$$

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

$\vec{n} = (5, 1, -2) \qquad |\vec{n}| = \sqrt{30}$

e)



$$\vec{v} = \mathrm{pr}_{\vec{n}}\, \vec{v} + \mathrm{pr}_{\pi}\, \vec{v}$$

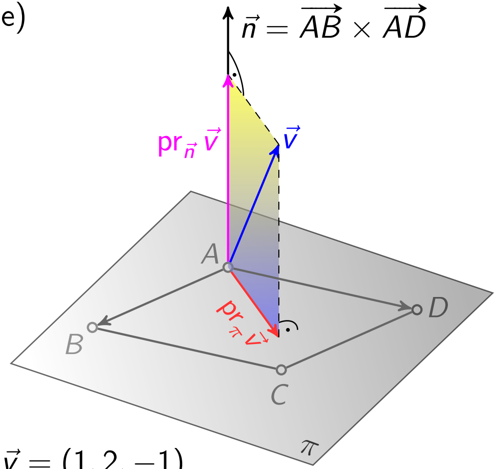
$$\mathrm{pr}_{\pi}\, \vec{v} =$$

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

$\vec{n} = (5, 1, -2) \qquad |\vec{n}| = \sqrt{30}$

e)

$$\vec{n} = \overrightarrow{AB} \times \overrightarrow{AD}$$



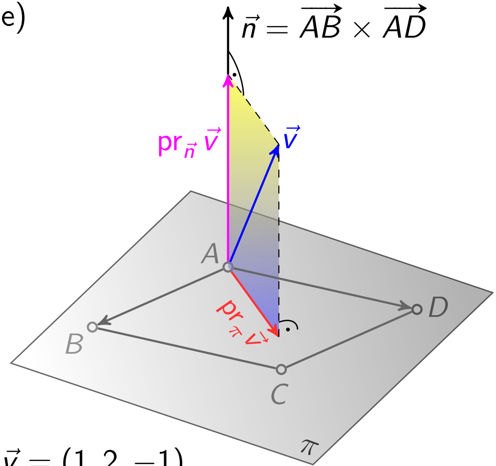
$$\vec{v} = \mathrm{pr}_{\vec{n}}\,\vec{v} + \mathrm{pr}_{\pi}\,\vec{v}$$

$$\mathrm{pr}_{\pi}\,\vec{v} = \vec{v} - \mathrm{pr}_{\vec{n}}\,\vec{v}$$

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

$$\vec{n} = (5, 1, -2) \qquad |\vec{n}| = \sqrt{30}$$

e)



$$\vec{v} = \mathrm{pr}_{\vec{n}}\, \vec{v} + \mathrm{pr}_{\pi}\, \vec{v}$$

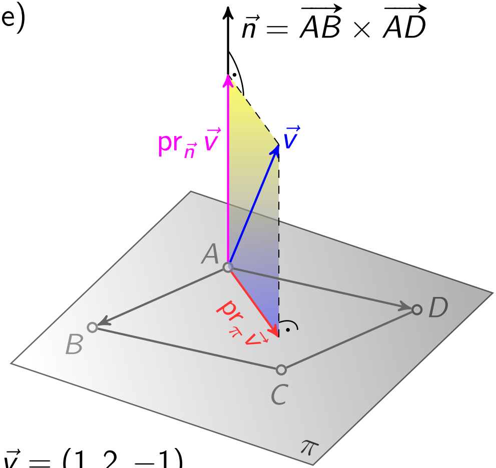
$$\mathrm{pr}_{\pi}\, \vec{v} = \vec{v} - \mathrm{pr}_{\vec{n}}\, \vec{v}$$

$$\mathrm{pr}_{\vec{n}}\, \vec{v} = \frac{\vec{v}\vec{n}}{|\vec{n}|^2} \cdot \vec{n}$$

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

$\vec{n} = (5, 1, -2) \qquad |\vec{n}| = \sqrt{30}$

e)



$$\vec{v} = \mathrm{pr}_{\vec{n}}\,\vec{v} + \mathrm{pr}_{\pi}\,\vec{v}$$

$$\mathrm{pr}_{\pi}\,\vec{v} = \vec{v} - \mathrm{pr}_{\vec{n}}\,\vec{v}$$

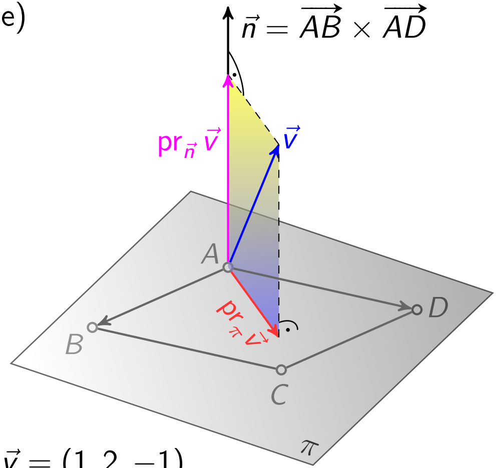
$$\mathrm{pr}_{\vec{n}}\,\vec{v} = \frac{\vec{v}\vec{n}}{|\vec{n}|^2} \cdot \vec{n}$$

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

$\vec{n} = (5, 1, -2)$ $\qquad |\vec{n}| = \sqrt{30}$

$\vec{v} \cdot \vec{n} =$

e)



$$\vec{v} = \text{pr}_{\vec{n}}\,\vec{v} + \text{pr}_{\pi}\,\vec{v}$$

$$\text{pr}_{\pi}\,\vec{v} = \vec{v} - \text{pr}_{\vec{n}}\,\vec{v}$$

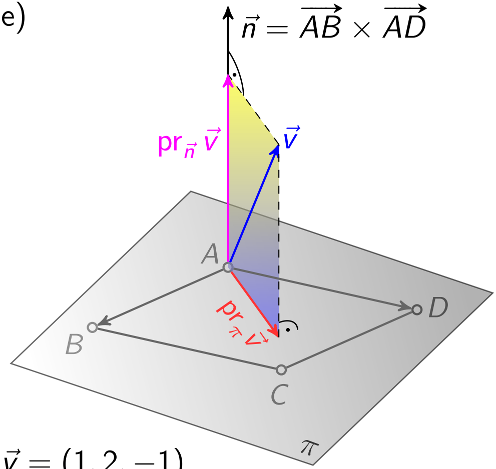
$$\text{pr}_{\vec{n}}\,\vec{v} = \frac{\vec{v}\vec{n}}{|\vec{n}|^2} \cdot \vec{n}$$

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

$\vec{n} = (5, 1, -2)$ $\quad |\vec{n}| = \sqrt{30}$

$\vec{v} \cdot \vec{n} = 1 \cdot 5$

e)



$$\vec{v} = \mathrm{pr}_{\vec{n}}\,\vec{v} + \mathrm{pr}_{\pi}\,\vec{v}$$

$$\mathrm{pr}_{\pi}\,\vec{v} = \vec{v} - \mathrm{pr}_{\vec{n}}\,\vec{v}$$

$$\mathrm{pr}_{\vec{n}}\,\vec{v} = \frac{\vec{v}\vec{n}}{|\vec{n}|^2} \cdot \vec{n}$$

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

$$\vec{n} = (5, 1, -2) \qquad |\vec{n}| = \sqrt{30}$$

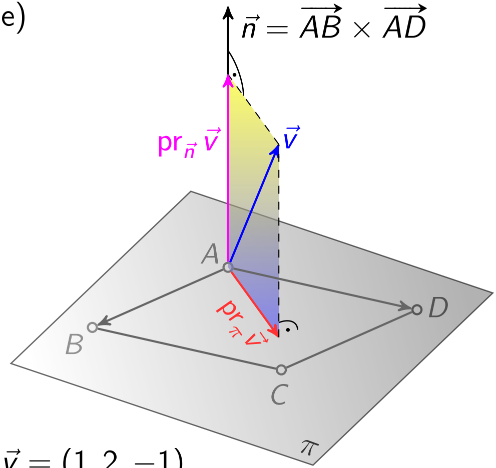
$$\vec{v} \cdot \vec{n} = 1 \cdot 5 + 2 \cdot 1$$

e)

$$\vec{n} = \overrightarrow{AB} \times \overrightarrow{AD}$$

$$\vec{v} = \mathrm{pr}_{\vec{n}}\,\vec{v} + \mathrm{pr}_{\pi}\,\vec{v}$$

$$\mathrm{pr}_{\pi}\,\vec{v} = \vec{v} - \mathrm{pr}_{\vec{n}}\,\vec{v}$$



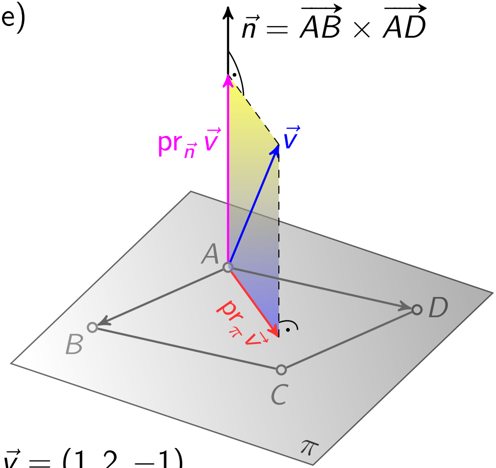
$$\mathrm{pr}_{\vec{n}}\,\vec{v} = \frac{\vec{v}\vec{n}}{|\vec{n}|^2} \cdot \vec{n}$$

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

$\vec{n} = (5, 1, -2) \qquad |\vec{n}| = \sqrt{30}$

$\vec{v} \cdot \vec{n} = 1 \cdot 5 + 2 \cdot 1 + (-1) \cdot (-2)$

e)



$$\vec{v} = \text{pr}_{\vec{n}}\, \vec{v} + \text{pr}_{\pi}\, \vec{v}$$

$$\text{pr}_{\pi}\, \vec{v} = \vec{v} - \text{pr}_{\vec{n}}\, \vec{v}$$

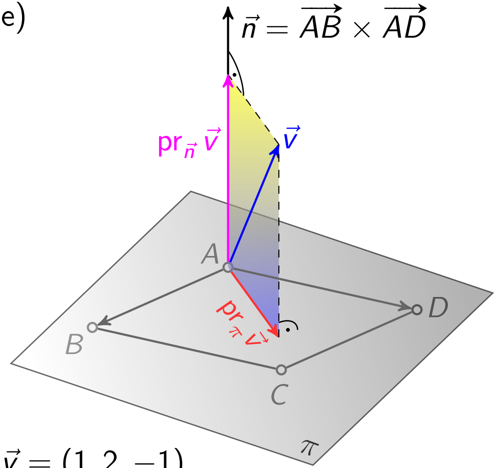
$$\text{pr}_{\vec{n}}\, \vec{v} = \frac{\vec{v}\vec{n}}{|\vec{n}|^2} \cdot \vec{n}$$

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

$\vec{n} = (5, 1, -2) \qquad |\vec{n}| = \sqrt{30}$

$\vec{v} \cdot \vec{n} = 1 \cdot 5 + 2 \cdot 1 + (-1) \cdot (-2) = 9$

e)



$$\vec{v} = \mathrm{pr}_{\vec{n}}\,\vec{v} + \mathrm{pr}_{\pi}\,\vec{v}$$

$$\mathrm{pr}_{\pi}\,\vec{v} = \vec{v} - \mathrm{pr}_{\vec{n}}\,\vec{v}$$

$$\mathrm{pr}_{\vec{n}}\,\vec{v} = \frac{\vec{v}\vec{n}}{|\vec{n}|^2} \cdot \vec{n}$$

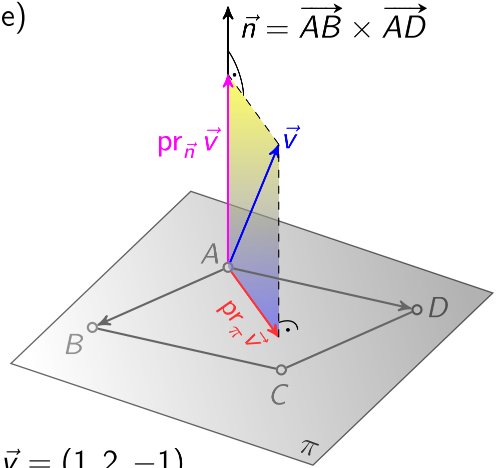
$$\mathrm{pr}_{\vec{n}}\,\vec{v} =$$

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

$$\vec{n} = (5, 1, -2) \qquad |\vec{n}| = \sqrt{30}$$

$$\vec{v} \cdot \vec{n} = 1 \cdot 5 + 2 \cdot 1 + (-1) \cdot (-2) = 9$$

e)



$$\vec{v} = \mathrm{pr}_{\vec{n}}\,\vec{v} + \mathrm{pr}_{\pi}\,\vec{v}$$

$$\mathrm{pr}_{\pi}\,\vec{v} = \vec{v} - \mathrm{pr}_{\vec{n}}\,\vec{v}$$

$$\mathrm{pr}_{\vec{n}}\,\vec{v} = \frac{\vec{v}\vec{n}}{|\vec{n}|^2} \cdot \vec{n}$$

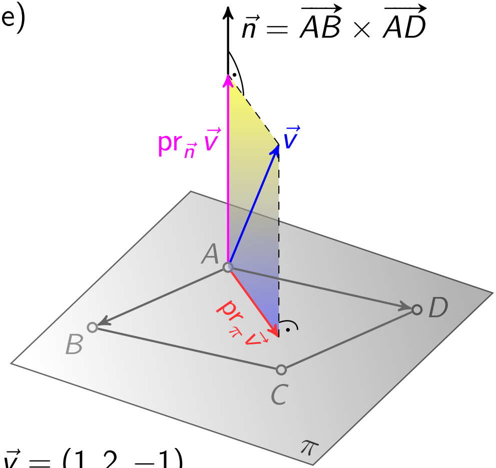
$$\mathrm{pr}_{\vec{n}}\,\vec{v} = \underline{\qquad\qquad}$$

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

$\vec{n} = (5, 1, -2) \qquad |\vec{n}| = \sqrt{30}$

$\vec{v} \cdot \vec{n} = 1 \cdot 5 + 2 \cdot 1 + (-1) \cdot (-2) = 9$

e)



$$\vec{v} = \text{pr}_{\vec{n}}\,\vec{v} + \text{pr}_{\pi}\,\vec{v}$$

$$\text{pr}_{\pi}\,\vec{v} = \vec{v} - \text{pr}_{\vec{n}}\,\vec{v}$$

$$\text{pr}_{\vec{n}}\,\vec{v} = \frac{\vec{v}\vec{n}}{|\vec{n}|^2} \cdot \vec{n}$$

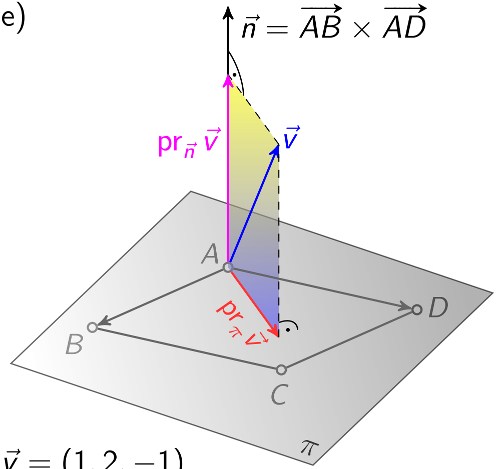
$$\text{pr}_{\vec{n}}\,\vec{v} = \frac{9}{}$$

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

$\vec{n} = (5, 1, -2) \qquad |\vec{n}| = \sqrt{30}$

$\vec{v} \cdot \vec{n} = 1 \cdot 5 + 2 \cdot 1 + (-1) \cdot (-2) = 9$

e)



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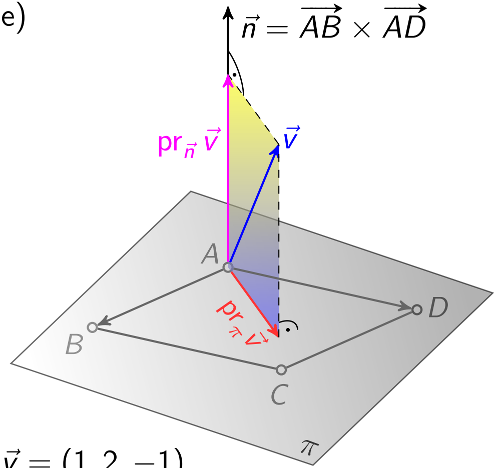

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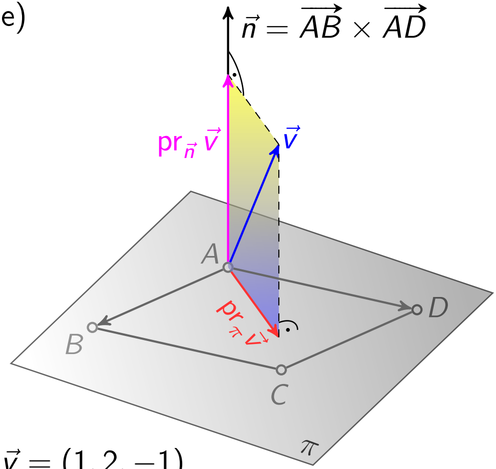

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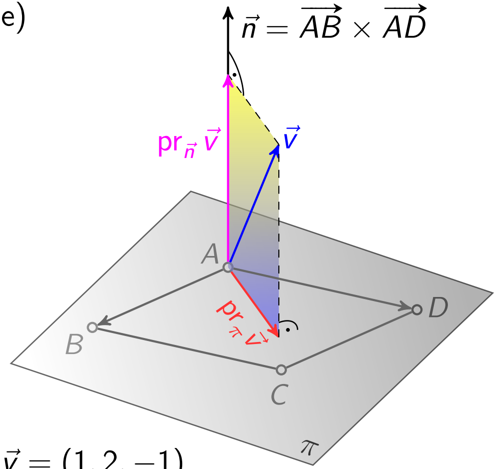

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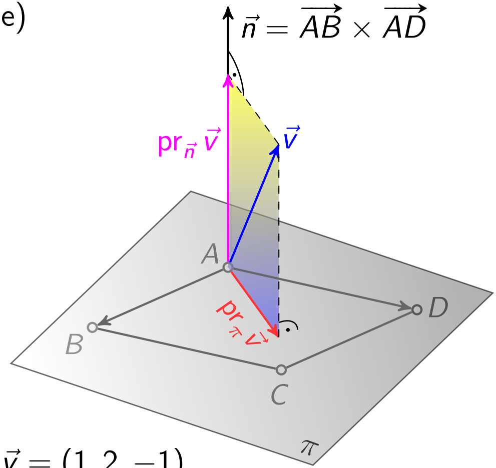

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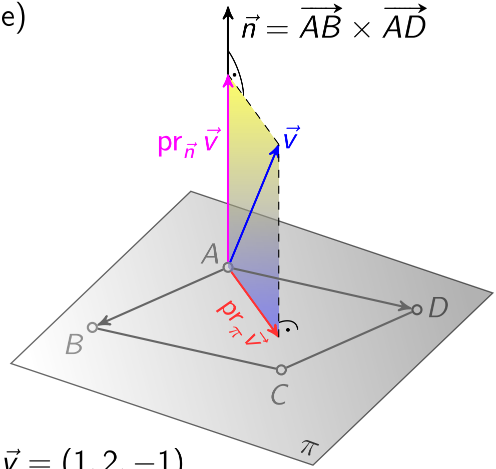

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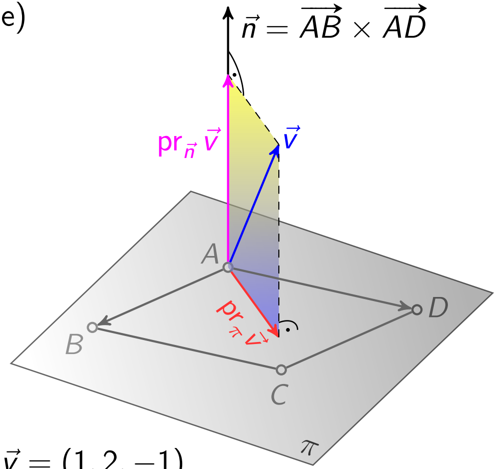

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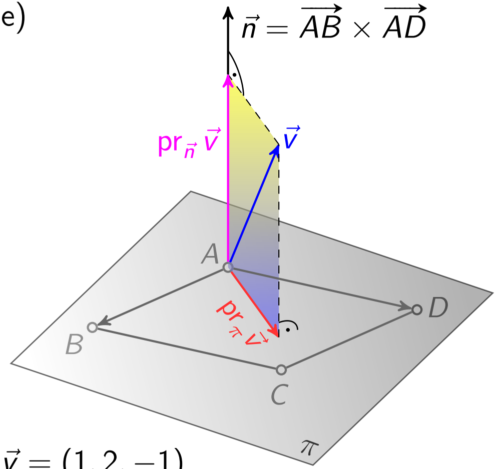

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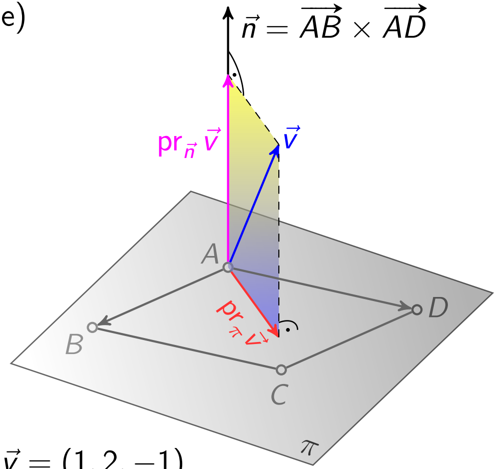

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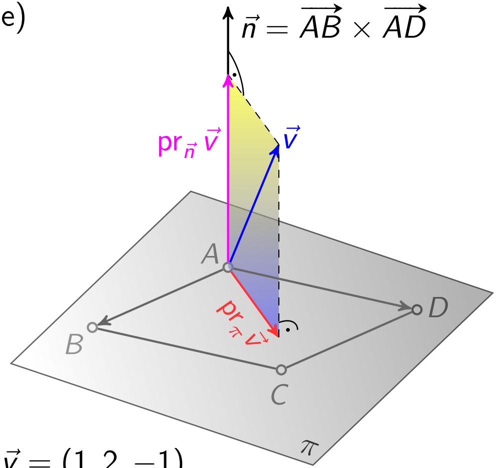

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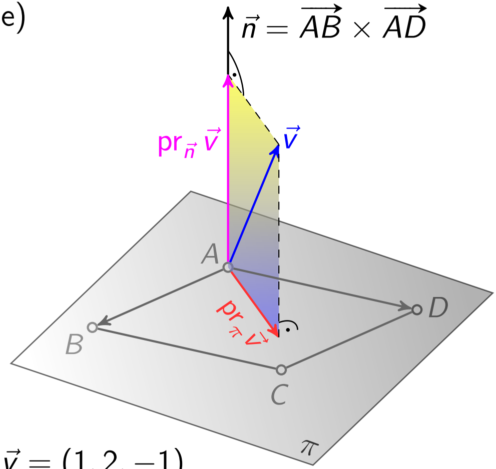

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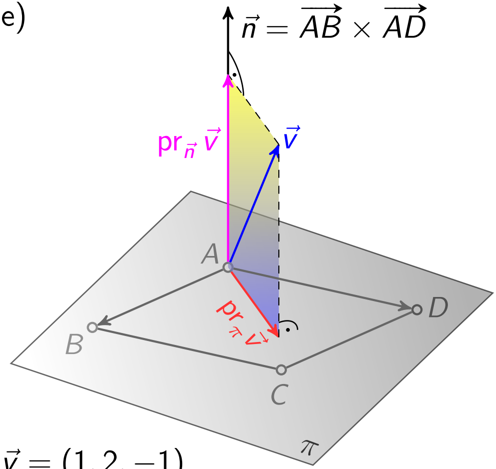

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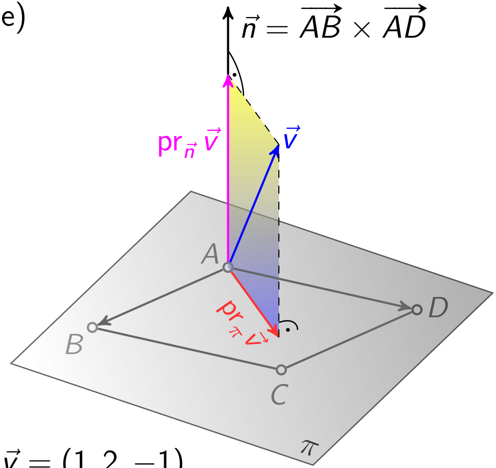

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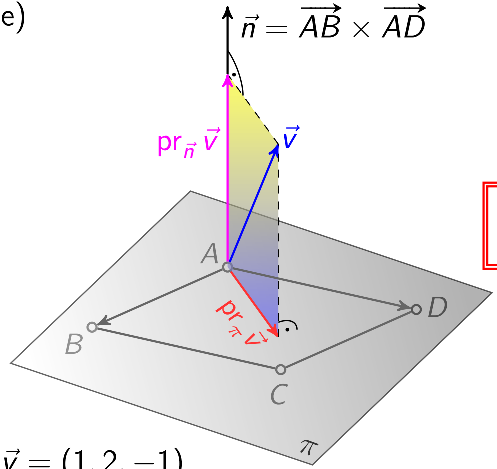

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drugi zadatak

Zadatak 2

Zadani su vektori $\vec{a} = (2m, 1, 1 - m)$, $\vec{b} = (-1, 3, 0)$ *i* $\vec{c} = (5, -1, 8)$.

a) *Odredite* $m \in \mathbb{R}$ *tako da vektor* $\vec{a}$ *zatvara jednake kutove s vektorima* $\vec{b}$ *i* $\vec{c}$.

b) *Za pronađeni m iz a) dijela zadatka izračunajte volumen tetraedra određenog s vektorima* $\vec{a}, \vec{b}, \vec{c}$ *i duljinu visine tog tetraedra spuštenu na stranu određenu s vektorima* $\vec{b}$ *i* $\vec{c}$.

Rješenje

a) $\vec{a} = (2m, 1, 1 - m), \quad \vec{b} = (-1, 3, 0), \quad \vec{c} = (5, -1, 8)$

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$$\cos\left(\vec{a}, \vec{b}\right)$$

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$$\frac{\vec{a} \cdot \vec{b}}{}$$

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$$\frac{\vec{a} \cdot \vec{b}}{|\vec{b}|}$$

Rješenje

a) $\vec{a} = (2m, 1, 1-m), \quad \vec{b} = (-1, 3, 0), \quad \vec{c} = (5, -1, 8)$

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$$\frac{\vec{a} \cdot \vec{b}}{|\vec{b}|} =$$

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$$\frac{\vec{a} \cdot \vec{b}}{|\vec{b}|} = \frac{\vec{a} \cdot \vec{c}}{|\vec{c}|}$$

$$\vec{a} \cdot \vec{b} = 2m \cdot (-1)$$

Rješenje

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$$\frac{\vec{a} \cdot \vec{b}}{|\vec{b}|} = \frac{\vec{a} \cdot \vec{c}}{|\vec{c}|}$$

$$\vec{a} \cdot \vec{b} = 2m \cdot (-1) + 1 \cdot 3$$

Rješenje

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$$\vec{a} \cdot \vec{b} = 2m \cdot (-1) + 1 \cdot 3 + (1 - m) \cdot 0 = -2m + 3$$

Rješenje

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$$\vec{a} \cdot \vec{b} = 2m \cdot (-1) + 1 \cdot 3 + (1 - m) \cdot 0 = -2m + 3$$

$$\vec{a} \cdot \vec{c} = 2m \cdot 5$$

Rješenje

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$$\vec{a} \cdot \vec{b} = 2m \cdot (-1) + 1 \cdot 3 + (1-m) \cdot 0 = -2m + 3$$

$$\vec{a} \cdot \vec{c} = 2m \cdot 5 + 1 \cdot (-1)$$

Rješenje

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Rješenje

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$$|\vec{b}| =$$

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$$|\vec{b}| = \sqrt{\qquad\qquad}$$

Rješenje

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$$|\vec{b}| = \sqrt{(-1)^2 \qquad\qquad}$$

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$$|\vec{b}| = \sqrt{(-1)^2 + 3^2}$$

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$$|\vec{b}| = \sqrt{(-1)^2 + 3^2 + 0^2} = \sqrt{10}$$

Rješenje

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$$|\vec{b}| = \sqrt{(-1)^2 + 3^2 + 0^2} = \sqrt{10}$$

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$$|\vec{c}| = \sqrt{}$$

Rješenje

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$$|\vec{b}| = \sqrt{(-1)^2 + 3^2 + 0^2} = \sqrt{10}$$

$$|\vec{c}| = \sqrt{5^2 \qquad\qquad\qquad}$$

Rješenje

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$$|\vec{b}| = \sqrt{(-1)^2 + 3^2 + 0^2} = \sqrt{10}$$

$$|\vec{c}| = \sqrt{5^2 + (-1)^2 }$$

Rješenje

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$$|\vec{b}| = \sqrt{(-1)^2 + 3^2 + 0^2} = \sqrt{10}$$

$$|\vec{c}| = \sqrt{5^2 + (-1)^2 + 8^2}$$

Rješenje

a) $\vec{a} = (2m, 1, 1-m), \quad \vec{b} = (-1, 3, 0), \quad \vec{c} = (5, -1, 8)$

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$$\vec{a}\cdot\vec{c} = 2m\cdot 5 + 1\cdot(-1) + (1-m)\cdot 8 = 2m+7$$

$$|\vec{b}| = \sqrt{(-1)^2+3^2+0^2} = \sqrt{10}$$

$$|\vec{c}| = \sqrt{5^2+(-1)^2+8^2} = \sqrt{90}$$

Rješenje

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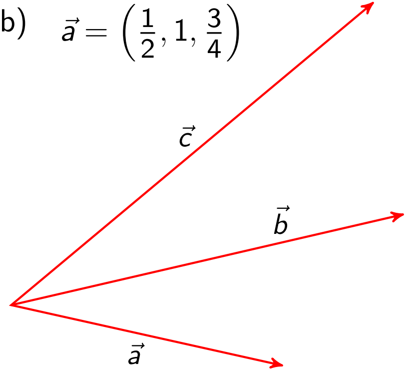

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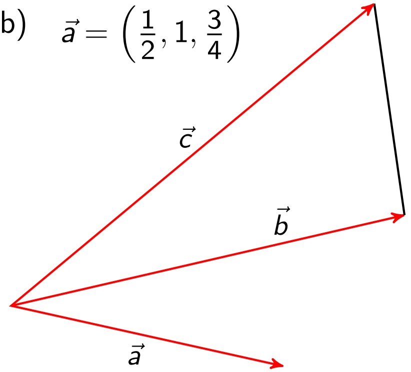

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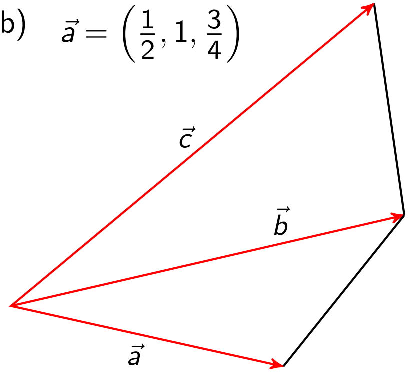

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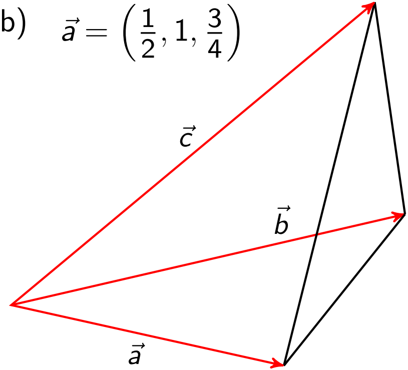

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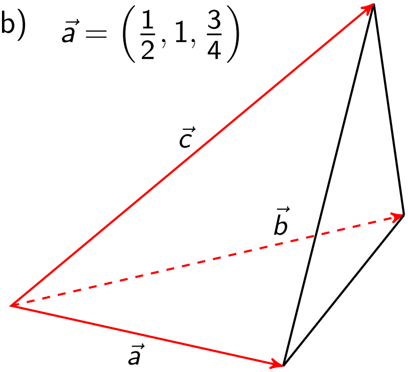

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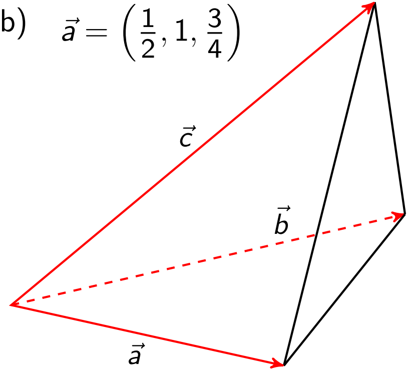

$$V = \frac{1}{6}\left|\left(\vec{a}, \vec{b}, \vec{c}\right)\right|$$

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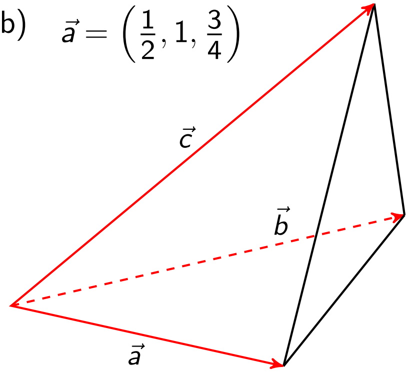

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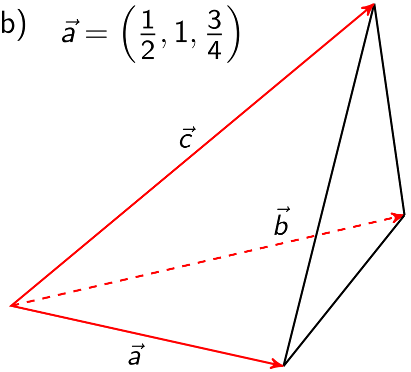

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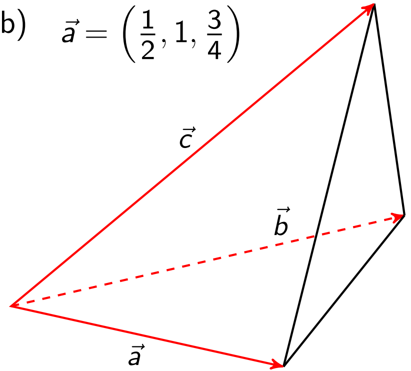

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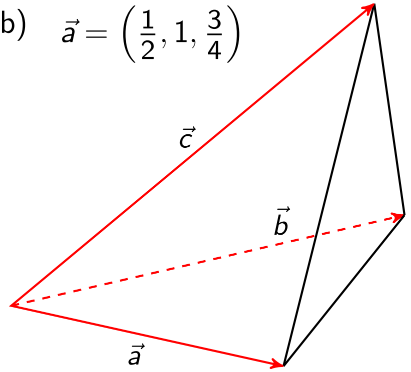

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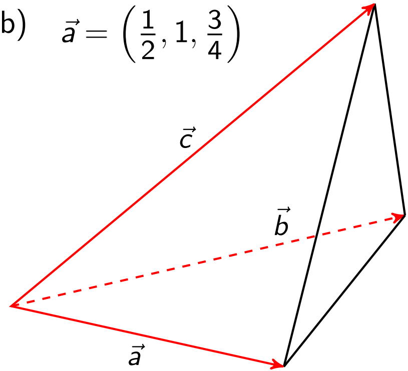

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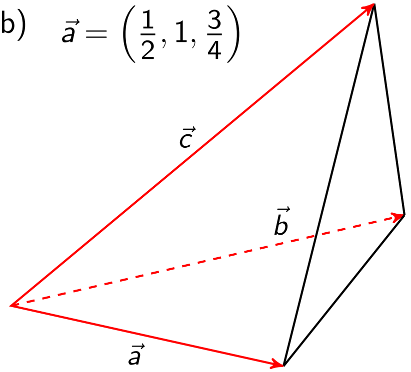

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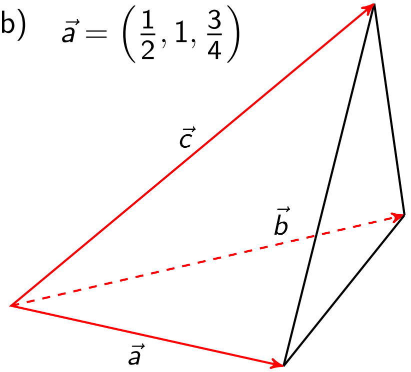

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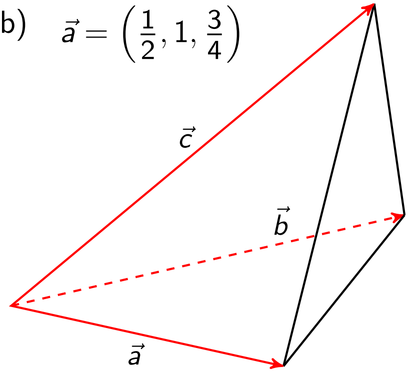

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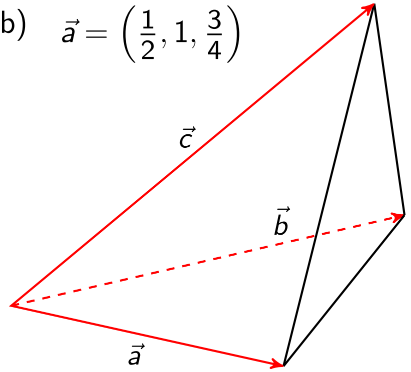

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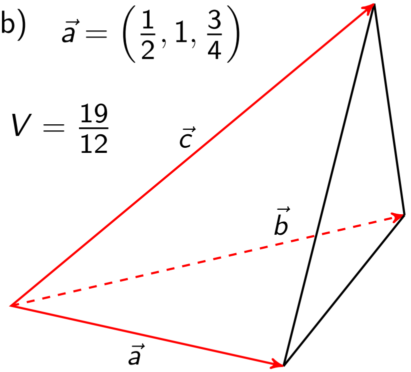

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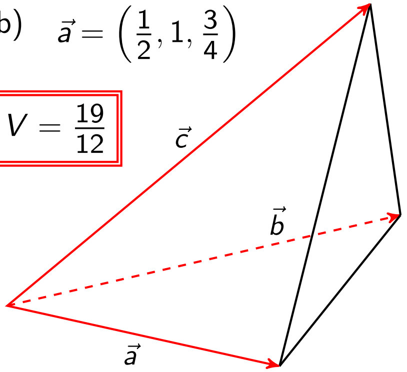

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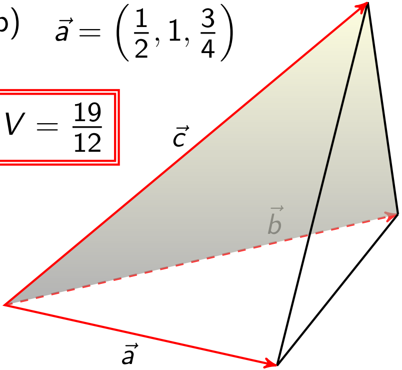

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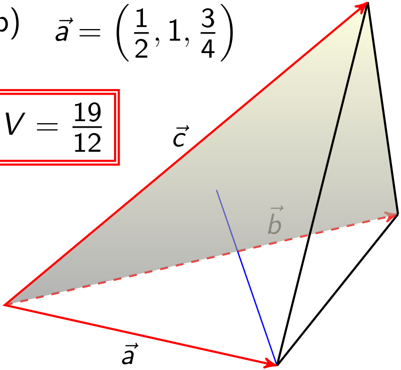

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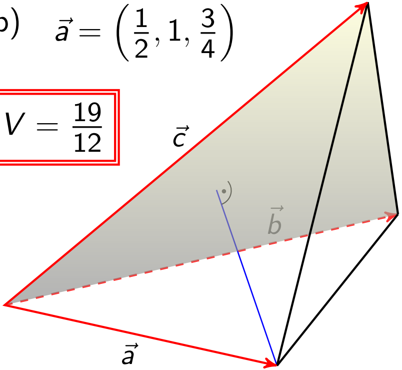

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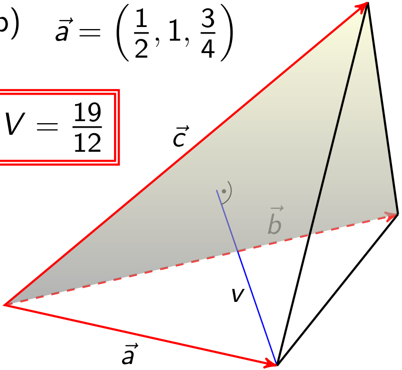

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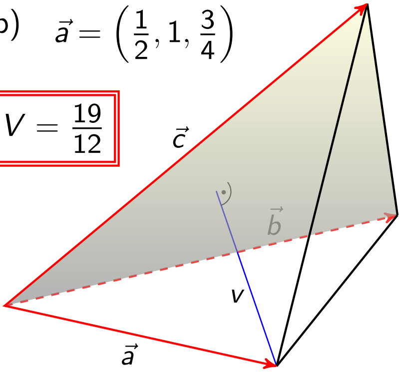

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$$V = \frac{1}{3} B v$$

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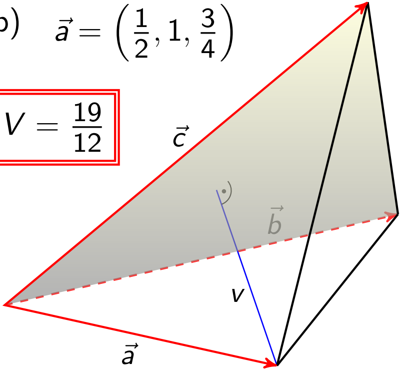

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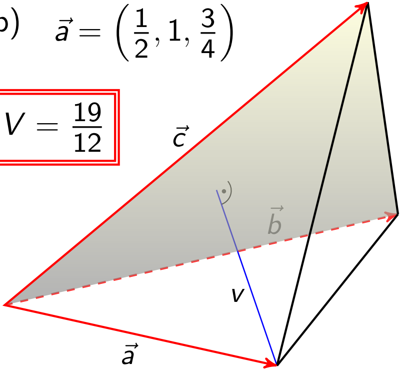

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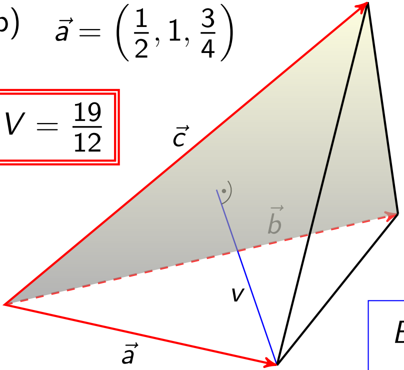

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$$B = \frac{1}{2}\left|\vec{b} \times \vec{c}\right|$$

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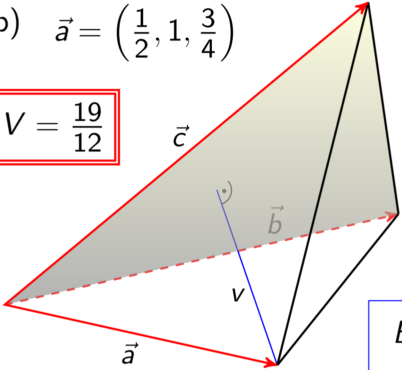

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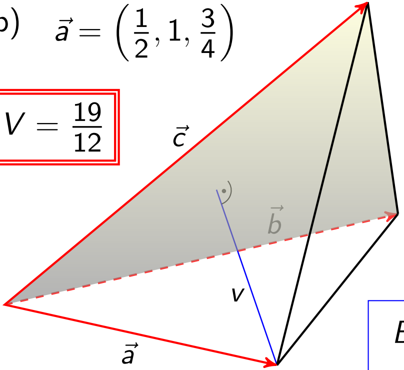

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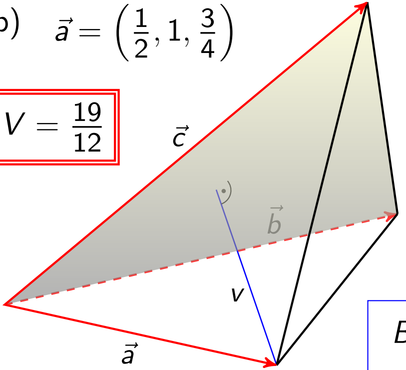

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$$B = \frac{1}{2}\left|\vec{b} \times \vec{c}\right|$$

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$$\vec{b} \times \vec{c} = \begin{vmatrix} \vec{i} & \vec{j} & \vec{k} \\ & & \\ & & \end{vmatrix}$$

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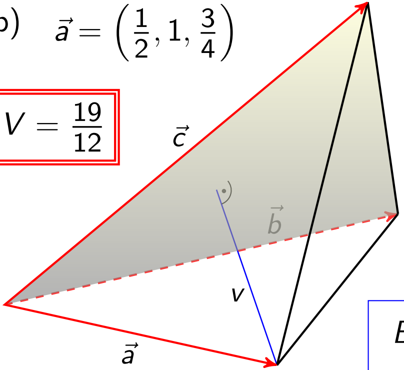

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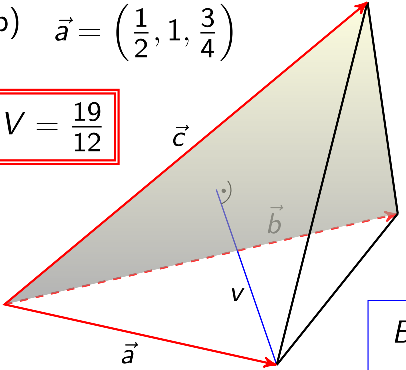

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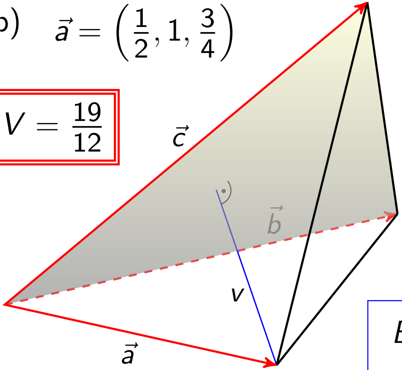
$$V = \frac{19}{12}$$



$$V = \frac{1}{6}\left|\left(\vec{a}, \vec{b}, \vec{c}\right)\right| = \frac{1}{6} \cdot \left|\frac{19}{2}\right| = \frac{19}{12}$$

$$\left(\vec{a}, \vec{b}, \vec{c}\right) = \begin{vmatrix} \frac{1}{2} & 1 & \frac{3}{4} \\ -1 & 3 & 0 \\ 5 & -1 & 8 \end{vmatrix} = \frac{19}{2}$$

$$B = \frac{1}{2}\left|\vec{b} \times \vec{c}\right|$$

$$V = \frac{1}{3}Bv \rightsquigarrow v = \frac{3V}{B}$$

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b) $\vec{a} = \left(\frac{1}{2}, 1, \frac{3}{4}\right)$ $\quad \vec{b} = (-1, 3, 0) \quad \vec{c} = (5, -1, 8)$

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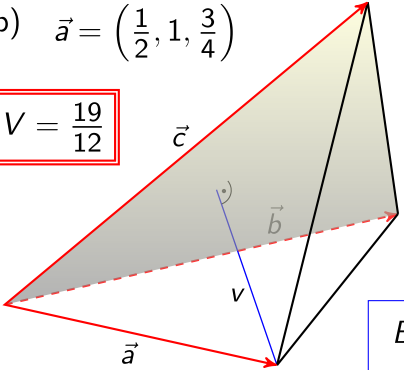

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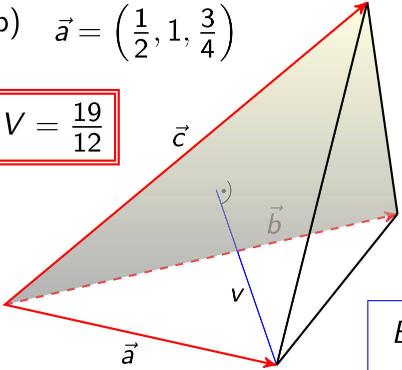

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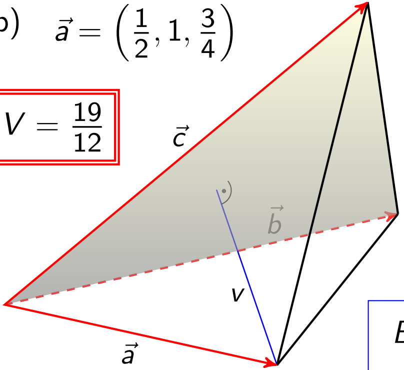

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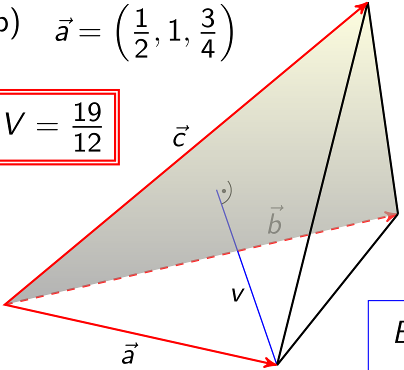
b) $\vec{a} = \left(\frac{1}{2}, 1, \frac{3}{4}\right)$ $\vec{b} = (-1, 3, 0)$ $\vec{c} = (5, -1, 8)$



$$V = \frac{19}{12}$$

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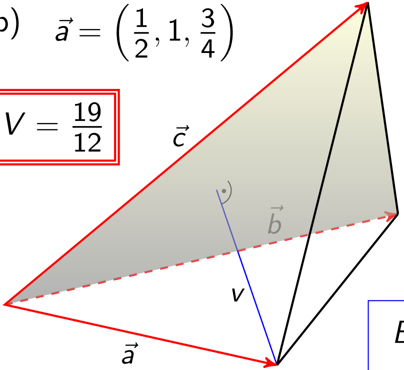
$$\boxed{V = \frac{19}{12}}$$



$$V = \frac{1}{6}\left|\left(\vec{a}, \vec{b}, \vec{c}\right)\right| = \frac{1}{6} \cdot \left|\frac{19}{2}\right| = \frac{19}{12}$$

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$$\left|\vec{b} \times \vec{c}\right| = \sqrt{}$$

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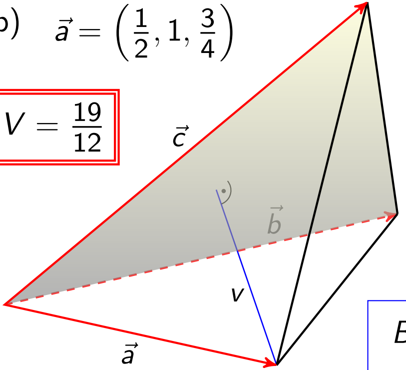

$$V = \frac{19}{12}$$

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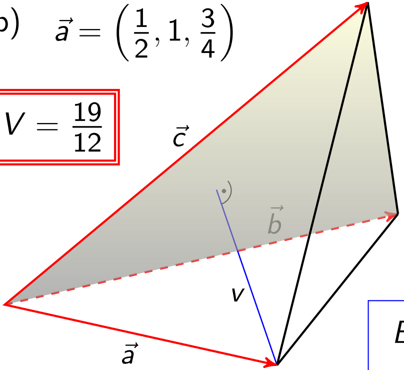
$$\left|\vec{b} \times \vec{c}\right| = \sqrt{24^2}$$

b) $\vec{a} = \left(\frac{1}{2}, 1, \frac{3}{4}\right)$ $\quad \vec{b} = (-1, 3, 0) \quad \vec{c} = (5, -1, 8)$

$$V = \frac{1}{6}\left|\left(\vec{a}, \vec{b}, \vec{c}\right)\right| = \frac{1}{6} \cdot \left|\frac{19}{2}\right| = \frac{19}{12}$$

$$\boxed{V = \frac{19}{12}}$$

$$\left(\vec{a}, \vec{b}, \vec{c}\right) = \begin{vmatrix} \frac{1}{2} & 1 & \frac{3}{4} \\ -1 & 3 & 0 \\ 5 & -1 & 8 \end{vmatrix} = \frac{19}{2}$$



$$B = \frac{1}{2}\left|\vec{b} \times \vec{c}\right|$$

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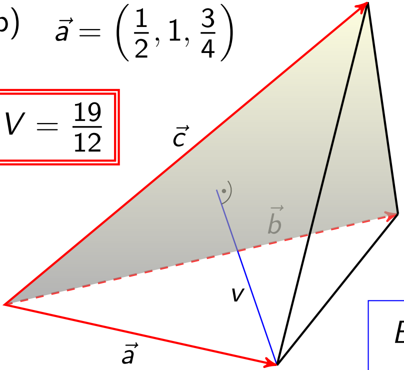
$$\left|\vec{b} \times \vec{c}\right| = \sqrt{24^2 + 8^2}$$

b) $\vec{a} = \left(\frac{1}{2}, 1, \frac{3}{4}\right)$ $\quad \vec{b} = (-1, 3, 0) \quad \vec{c} = (5, -1, 8)$



$$V = \frac{19}{12}$$

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$$V = \frac{1}{3} B v \rightsquigarrow v = \frac{3V}{B}$$

$$B = \frac{1}{2}\left|\vec{b} \times \vec{c}\right|$$

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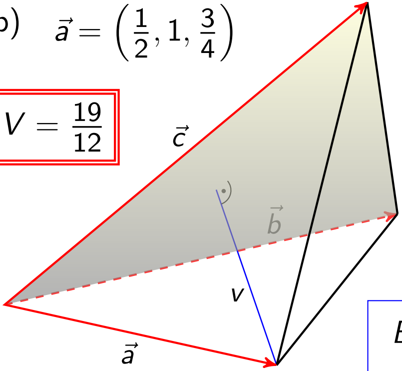
b) $\vec{a} = \left(\frac{1}{2}, 1, \frac{3}{4}\right)$ $\quad \vec{b} = (-1, 3, 0) \quad \vec{c} = (5, -1, 8)$

$$\boxed{V = \frac{19}{12}}$$



$$V = \frac{1}{6}\left|\left(\vec{a}, \vec{b}, \vec{c}\right)\right| = \frac{1}{6} \cdot \left|\frac{19}{2}\right| = \frac{19}{12}$$

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$$V = \frac{1}{3} B v \rightsquigarrow \boxed{v = \frac{3V}{B}}$$

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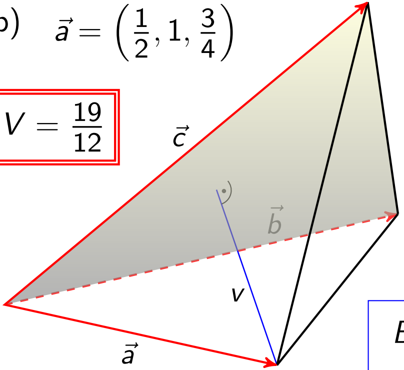
$$\left|\vec{b} \times \vec{c}\right| = \sqrt{24^2 + 8^2 + (-14)^2} = \sqrt{836}$$

b) $\vec{a} = \left(\frac{1}{2}, 1, \frac{3}{4}\right)$ $\quad \vec{b} = (-1, 3, 0) \quad \vec{c} = (5, -1, 8)$



$$V = \frac{19}{12}$$

$$V = \frac{1}{6}\left|(\vec{a}, \vec{b}, \vec{c})\right| = \frac{1}{6} \cdot \left|\frac{19}{2}\right| = \frac{19}{12}$$

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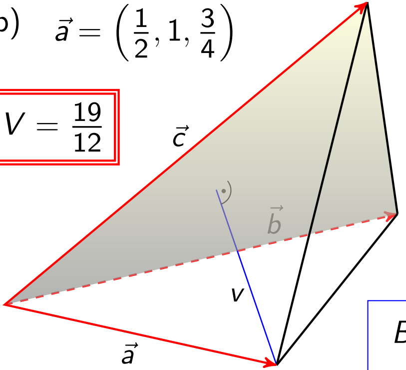
$$\left|\vec{b} \times \vec{c}\right| = \sqrt{24^2 + 8^2 + (-14)^2} = \sqrt{836} = 2\sqrt{209}$$

b) $\vec{a} = \left(\frac{1}{2}, 1, \frac{3}{4}\right)$ $\vec{b} = (-1, 3, 0)$ $\vec{c} = (5, -1, 8)$

$$V = \frac{19}{12}$$



$$V = \frac{1}{6}\left|\left(\vec{a}, \vec{b}, \vec{c}\right)\right| = \frac{1}{6} \cdot \left|\frac{19}{2}\right| = \frac{19}{12}$$

$$\left(\vec{a}, \vec{b}, \vec{c}\right) = \begin{vmatrix} \frac{1}{2} & 1 & \frac{3}{4} \\ -1 & 3 & 0 \\ 5 & -1 & 8 \end{vmatrix} = \frac{19}{2}$$

$$B = \frac{1}{2}\left|\vec{b} \times \vec{c}\right|$$

$$B =$$

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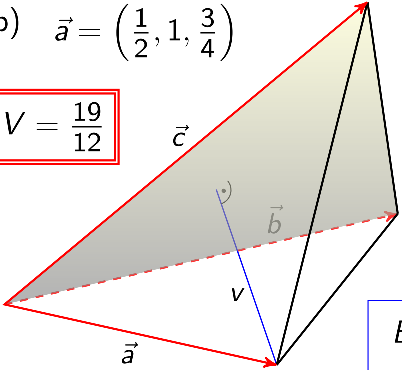

$$\boxed{V = \frac{19}{12}}$$

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$$B = \frac{1}{2}\left|\vec{b} \times \vec{c}\right|$$

$$B = \frac{1}{2} \cdot$$

$$V = \frac{1}{3} B v \rightsquigarrow \boxed{v = \frac{3V}{B}}$$

$$\vec{b} \times \vec{c} = \begin{vmatrix} \vec{i} & \vec{j} & \vec{k} \\ -1 & 3 & 0 \\ 5 & -1 & 8 \end{vmatrix} = (24, 8, -14)$$

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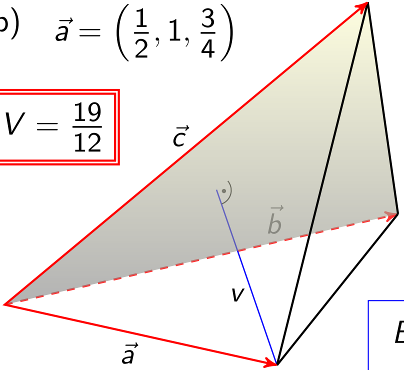
b) $\vec{a} = \left(\frac{1}{2}, 1, \frac{3}{4}\right)$ $\vec{b} = (-1, 3, 0)$ $\vec{c} = (5, -1, 8)$



$$V = \frac{19}{12}$$

$$V = \frac{1}{6}\left|\left(\vec{a}, \vec{b}, \vec{c}\right)\right| = \frac{1}{6} \cdot \left|\frac{19}{2}\right| = \frac{19}{12}$$

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$$B = \frac{1}{2}\left|\vec{b} \times \vec{c}\right|$$

$$B = \frac{1}{2} \cdot 2\sqrt{209}$$

$$V = \frac{1}{3} B v \rightsquigarrow v = \frac{3V}{B}$$

$$\vec{b} \times \vec{c} = \begin{vmatrix} \vec{i} & \vec{j} & \vec{k} \\ -1 & 3 & 0 \\ 5 & -1 & 8 \end{vmatrix} = (24, 8, -14)$$

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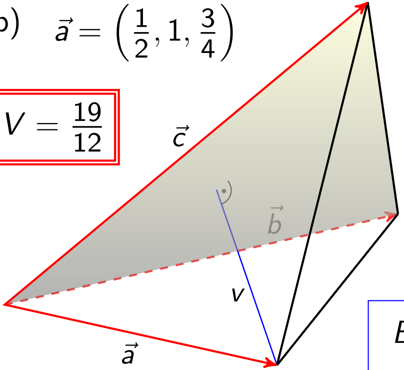

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$$B = \frac{1}{2}\left|\vec{b} \times \vec{c}\right|$$

$$B = \frac{1}{2} \cdot 2\sqrt{209}$$

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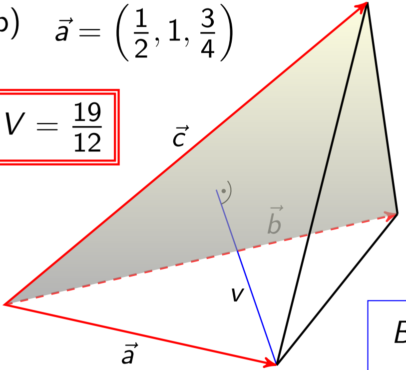

$$\boxed{V = \frac{19}{12}}$$

$$V = \frac{1}{6}\left|(\vec{a}, \vec{b}, \vec{c})\right| = \frac{1}{6} \cdot \left|\frac{19}{2}\right| = \frac{19}{12}$$

$$(\vec{a}, \vec{b}, \vec{c}) = \begin{vmatrix} \frac{1}{2} & 1 & \frac{3}{4} \\ -1 & 3 & 0 \\ 5 & -1 & 8 \end{vmatrix} = \frac{19}{2}$$

$$V = \frac{1}{3}Bv \rightsquigarrow \boxed{v = \frac{3V}{B}}$$

$$B = \frac{1}{2}\left|\vec{b} \times \vec{c}\right|$$

$$B = \frac{1}{2} \cdot 2\sqrt{209}$$

$$B = \sqrt{209}$$

$$v = \frac{3V}{B}$$

$$\vec{b} \times \vec{c} = \begin{vmatrix} \vec{i} & \vec{j} & \vec{k} \\ -1 & 3 & 0 \\ 5 & -1 & 8 \end{vmatrix} = (24, 8, -14)$$

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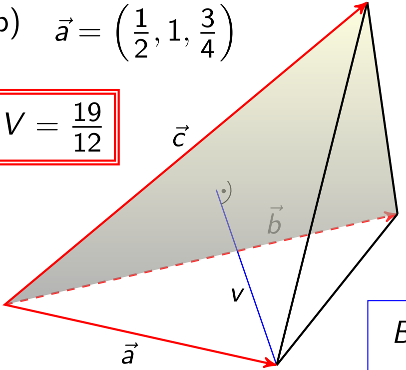
$$\boxed{V = \frac{19}{12}}$$



$$V = \frac{1}{6}\left|\left(\vec{a}, \vec{b}, \vec{c}\right)\right| = \frac{1}{6} \cdot \left|\frac{19}{2}\right| = \frac{19}{12}$$

$$\left(\vec{a}, \vec{b}, \vec{c}\right) = \begin{vmatrix} \frac{1}{2} & 1 & \frac{3}{4} \\ -1 & 3 & 0 \\ 5 & -1 & 8 \end{vmatrix} = \frac{19}{2}$$

$$V = \frac{1}{3} B v \rightsquigarrow \boxed{v = \frac{3V}{B}}$$

$$B = \frac{1}{2}\left|\vec{b} \times \vec{c}\right|$$

$$B = \frac{1}{2} \cdot 2\sqrt{209}$$

$$B = \sqrt{209}$$

$$v = \frac{3V}{B}$$

$$v =$$

$$\vec{b} \times \vec{c} = \begin{vmatrix} \vec{i} & \vec{j} & \vec{k} \\ -1 & 3 & 0 \\ 5 & -1 & 8 \end{vmatrix} = (24, 8, -14)$$

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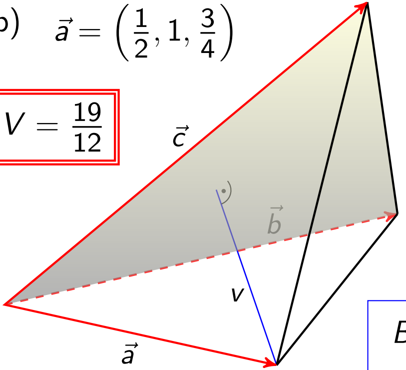
b) $\vec{a} = \left(\frac{1}{2}, 1, \frac{3}{4}\right)$ $\vec{b} = (-1, 3, 0)$ $\vec{c} = (5, -1, 8)$



$$\boxed{V = \frac{19}{12}}$$

$$V = \frac{1}{6}\left|\left(\vec{a}, \vec{b}, \vec{c}\right)\right| = \frac{1}{6} \cdot \left|\frac{19}{2}\right| = \frac{19}{12}$$

$$\left(\vec{a}, \vec{b}, \vec{c}\right) = \begin{vmatrix} \frac{1}{2} & 1 & \frac{3}{4} \\ -1 & 3 & 0 \\ 5 & -1 & 8 \end{vmatrix} = \frac{19}{2}$$

$$V = \frac{1}{3}Bv \rightsquigarrow \boxed{v = \frac{3V}{B}}$$

$$B = \frac{1}{2}\left|\vec{b} \times \vec{c}\right|$$

$$B = \frac{1}{2} \cdot 2\sqrt{209}$$

$$B = \sqrt{209}$$

$$v = \frac{3V}{B}$$

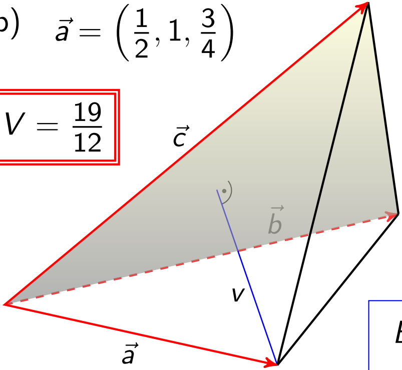
$$v = \_\_\_\_\_\_$$

$$\vec{b} \times \vec{c} = \begin{vmatrix} \vec{i} & \vec{j} & \vec{k} \\ -1 & 3 & 0 \\ 5 & -1 & 8 \end{vmatrix} = (24, 8, -14)$$

$$\left|\vec{b} \times \vec{c}\right| = \sqrt{24^2 + 8^2 + (-14)^2} = \sqrt{836} = 2\sqrt{209}$$

b) $\vec{a} = \left(\frac{1}{2}, 1, \frac{3}{4}\right)$ $\qquad \vec{b} = (-1, 3, 0) \qquad \vec{c} = (5, -1, 8)$

$$\boxed{V = \frac{19}{12}}$$



$$V = \frac{1}{6}\left|\left(\vec{a}, \vec{b}, \vec{c}\right)\right| = \frac{1}{6} \cdot \left|\frac{19}{2}\right| = \frac{19}{12}$$

$$\left(\vec{a}, \vec{b}, \vec{c}\right) = \begin{vmatrix} \frac{1}{2} & 1 & \frac{3}{4} \\ -1 & 3 & 0 \\ 5 & -1 & 8 \end{vmatrix} = \frac{19}{2}$$

$$V = \frac{1}{3}Bv \rightsquigarrow \boxed{v = \frac{3V}{B}}$$

$$B = \frac{1}{2}\left|\vec{b} \times \vec{c}\right|$$

$$B = \frac{1}{2} \cdot 2\sqrt{209}$$

$$B = \sqrt{209}$$

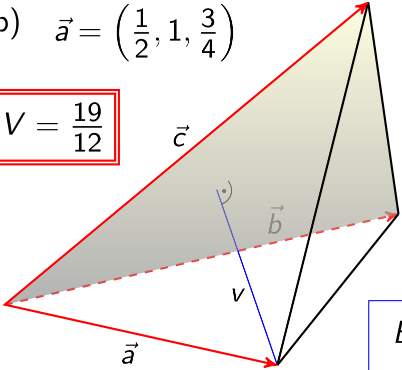
$$v = \frac{3V}{B}$$

$$v = \frac{3 \cdot \frac{19}{12}}{}$$

$$\vec{b} \times \vec{c} = \begin{vmatrix} \vec{i} & \vec{j} & \vec{k} \\ -1 & 3 & 0 \\ 5 & -1 & 8 \end{vmatrix} = (24, 8, -14)$$

$$\left|\vec{b} \times \vec{c}\right| = \sqrt{24^2 + 8^2 + (-14)^2} = \sqrt{836} = 2\sqrt{209}$$

b) $\vec{a} = \left(\frac{1}{2}, 1, \frac{3}{4}\right)$ $\quad \vec{b} = (-1, 3, 0) \quad \vec{c} = (5, -1, 8)$



$$\boxed{V = \frac{19}{12}}$$

$$V = \frac{1}{6}\left|\left(\vec{a}, \vec{b}, \vec{c}\right)\right| = \frac{1}{6} \cdot \left|\frac{19}{2}\right| = \frac{19}{12}$$

$$\left(\vec{a}, \vec{b}, \vec{c}\right) = \begin{vmatrix} \frac{1}{2} & 1 & \frac{3}{4} \\ -1 & 3 & 0 \\ 5 & -1 & 8 \end{vmatrix} = \frac{19}{2}$$

$$V = \frac{1}{3} B v \rightsquigarrow \boxed{v = \frac{3V}{B}}$$

$$B = \frac{1}{2}\left|\vec{b} \times \vec{c}\right|$$

$$B = \frac{1}{2} \cdot 2\sqrt{209}$$

$$B = \sqrt{209}$$

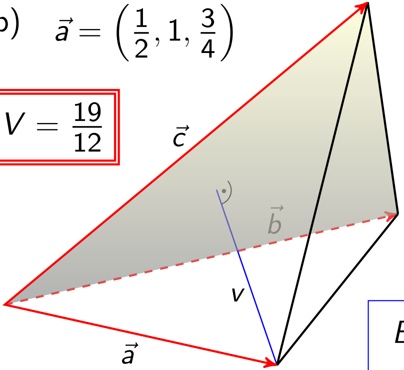
$$v = \frac{3V}{B}$$

$$v = \frac{3 \cdot \frac{19}{12}}{\sqrt{209}}$$

$$\vec{b} \times \vec{c} = \begin{vmatrix} \vec{i} & \vec{j} & \vec{k} \\ -1 & 3 & 0 \\ 5 & -1 & 8 \end{vmatrix} = (24, 8, -14)$$

$$\left|\vec{b} \times \vec{c}\right| = \sqrt{24^2 + 8^2 + (-14)^2} = \sqrt{836} = 2\sqrt{209}$$

b) $\vec{a} = \left(\frac{1}{2}, 1, \frac{3}{4}\right)$ $\vec{b} = (-1, 3, 0)$ $\vec{c} = (5, -1, 8)$



$$V = \frac{19}{12}$$

$$V = \frac{1}{6}\left|\left(\vec{a}, \vec{b}, \vec{c}\right)\right| = \frac{1}{6} \cdot \left|\frac{19}{2}\right| = \frac{19}{12}$$

$$\left(\vec{a}, \vec{b}, \vec{c}\right) = \begin{vmatrix} \frac{1}{2} & 1 & \frac{3}{4} \\ -1 & 3 & 0 \\ 5 & -1 & 8 \end{vmatrix} = \frac{19}{2}$$

$$V = \frac{1}{3}Bv \rightsquigarrow v = \frac{3V}{B}$$

$$B = \frac{1}{2}\left|\vec{b} \times \vec{c}\right|$$

$$B = \frac{1}{2} \cdot 2\sqrt{209}$$

$$B = \sqrt{209}$$

$$v = \frac{3V}{B}$$

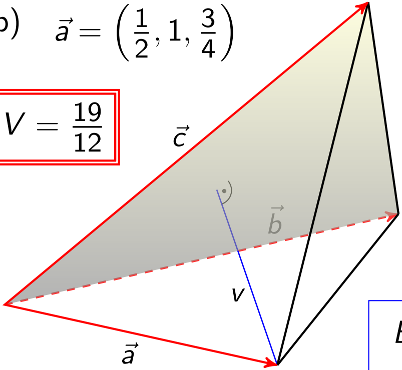
$$v = \frac{3 \cdot \frac{19}{12}}{\sqrt{209}}$$

$$v = \frac{19}{4\sqrt{209}}$$

$$\vec{b} \times \vec{c} = \begin{vmatrix} \vec{i} & \vec{j} & \vec{k} \\ -1 & 3 & 0 \\ 5 & -1 & 8 \end{vmatrix} = (24, 8, -14)$$

$$\left|\vec{b} \times \vec{c}\right| = \sqrt{24^2 + 8^2 + (-14)^2} = \sqrt{836} = 2\sqrt{209}$$

b) $\vec{a} = \left(\frac{1}{2}, 1, \frac{3}{4}\right)$ $\quad \vec{b} = (-1, 3, 0) \quad \vec{c} = (5, -1, 8)$



$$V = \frac{19}{12}$$

$$V = \frac{1}{6}\left|\left(\vec{a}, \vec{b}, \vec{c}\right)\right| = \frac{1}{6} \cdot \left|\frac{19}{2}\right| = \frac{19}{12}$$

$$\left(\vec{a}, \vec{b}, \vec{c}\right) = \begin{vmatrix} \frac{1}{2} & 1 & \frac{3}{4} \\ -1 & 3 & 0 \\ 5 & -1 & 8 \end{vmatrix} = \frac{19}{2}$$

$$V = \frac{1}{3}Bv \rightsquigarrow v = \frac{3V}{B}$$

$$B = \frac{1}{2}\left|\vec{b} \times \vec{c}\right|$$

$$B = \frac{1}{2} \cdot 2\sqrt{209}$$

$$B = \sqrt{209}$$

$$v = \frac{3V}{B}$$

$$v = \frac{3 \cdot \frac{19}{12}}{\sqrt{209}}$$

$$v = \frac{19}{4\sqrt{209}}$$

$$\vec{b} \times \vec{c} = \begin{vmatrix} \vec{i} & \vec{j} & \vec{k} \\ -1 & 3 & 0 \\ 5 & -1 & 8 \end{vmatrix} = (24, 8, -14)$$

$$\left|\vec{b} \times \vec{c}\right| = \sqrt{24^2 + 8^2 + (-14)^2} = \sqrt{836} = 2\sqrt{209}$$

treći zadatak

Zadatak 3

Zadane su točke $A(1,2,1), B(2,3,1)$ *i* $C(-2,5,3)$.

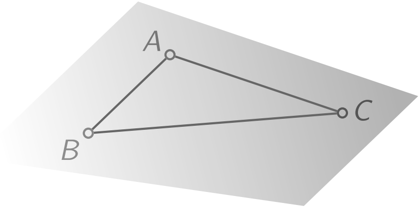
a) *Pokažite da je* ABC *pravokutni trokut s pravim kutom kod vrha* A.

b) *Odredite točku* D *za koju je* $|AD| = \sqrt{11}$ *tako da vektori* $\overrightarrow{AB}$, $\overrightarrow{AC}$, $\overrightarrow{AD}$ *budu međusobno okomiti i u danom poretku čine desnu bazu za* V^3.

Rješenje

$A(1,2,1), \quad B(2,3,1), \quad C(-2,5,3)$

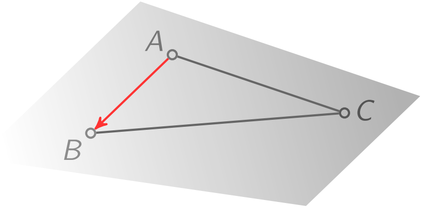
a)



Rješenje

$A(1,2,1), \quad B(2,3,1), \quad C(-2,5,3)$

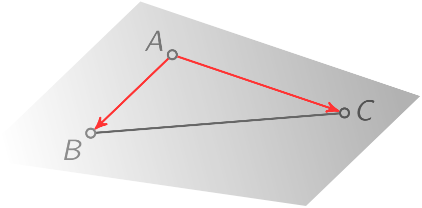
a)



Rješenje

$A(1,2,1), \quad B(2,3,1), \quad C(-2,5,3)$

a)

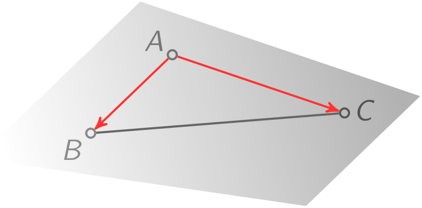


Rješenje

a)

$$A(1,2,1),\quad B(2,3,1),\quad C(-2,5,3)$$

$$\overrightarrow{AB} =$$

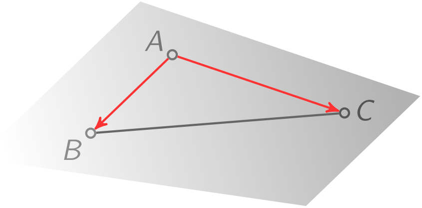


Rješenje

a)

$$A(1,2,1),\quad B(2,3,1),\quad C(-2,5,3)$$

$$\overrightarrow{AB} = (1,1,0)$$

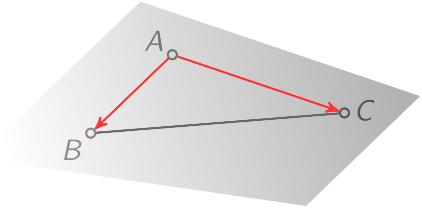


Rješenje

a)

$$A(1,2,1),\quad B(2,3,1),\quad C(-2,5,3)$$

$$\overrightarrow{AB} = (1,1,0) \qquad \overrightarrow{AC} =$$

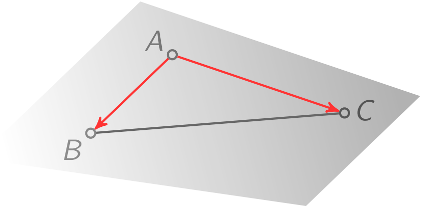


Rješenje

a)

$$A(1,2,1),\quad B(2,3,1),\quad C(-2,5,3)$$

$$\overrightarrow{AB} = (1,1,0) \qquad \overrightarrow{AC} = (-3,3,2)$$

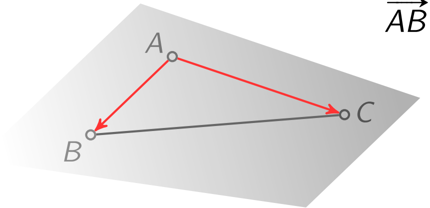


Rješenje

a)

$$A(1,2,1),\quad B(2,3,1),\quad C(-2,5,3)$$

$$\overrightarrow{AB}=(1,1,0)\qquad \overrightarrow{AC}=(-3,3,2)$$



$$\overrightarrow{AB}\cdot\overrightarrow{AC}=$$

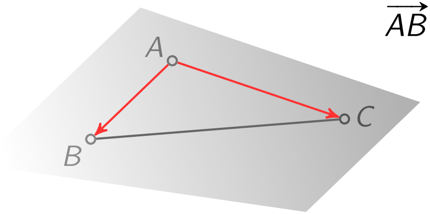
Rješenje

a)

$$A(1,2,1),\quad B(2,3,1),\quad C(-2,5,3)$$

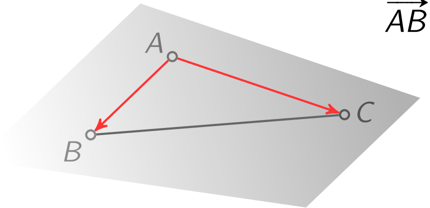
$$\overrightarrow{AB} = (1,1,0) \qquad \overrightarrow{AC} = (-3,3,2)$$

$$\overrightarrow{AB} \cdot \overrightarrow{AC} = 1 \cdot (-3)$$



Rješenje

a)



$$A(1,2,1),\quad B(2,3,1),\quad C(-2,5,3)$$

$$\overrightarrow{AB} = (1,1,0) \qquad \overrightarrow{AC} = (-3,3,2)$$

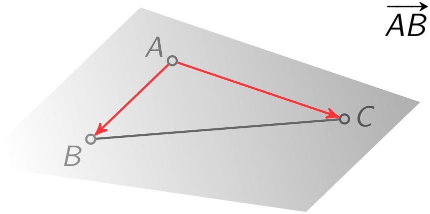
$$\overrightarrow{AB} \cdot \overrightarrow{AC} = 1 \cdot (-3) + 1 \cdot 3$$

Rješenje

a)

$$A(1,2,1),\quad B(2,3,1),\quad C(-2,5,3)$$

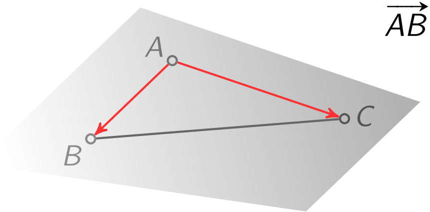
$$\overrightarrow{AB} = (1,1,0) \qquad \overrightarrow{AC} = (-3,3,2)$$



$$\overrightarrow{AB} \cdot \overrightarrow{AC} = 1 \cdot (-3) + 1 \cdot 3 + 0 \cdot 2$$

Rješenje

a)



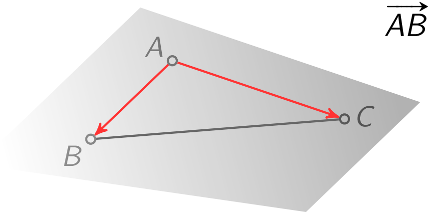
$$A(1,2,1), \quad B(2,3,1), \quad C(-2,5,3)$$

$$\overrightarrow{AB} = (1,1,0) \qquad \overrightarrow{AC} = (-3,3,2)$$

$$\overrightarrow{AB} \cdot \overrightarrow{AC} = 1 \cdot (-3) + 1 \cdot 3 + 0 \cdot 2 = 0$$

Rješenje

a)



$$A(1,2,1),\quad B(2,3,1),\quad C(-2,5,3)$$

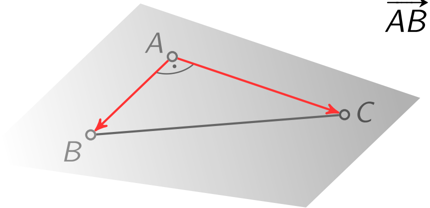
$$\overrightarrow{AB} = (1,1,0) \qquad \overrightarrow{AC} = (-3,3,2)$$

$$\overrightarrow{AB} \cdot \overrightarrow{AC} = 1 \cdot (-3) + 1 \cdot 3 + 0 \cdot 2 = 0$$

$$\overrightarrow{AB} \perp \overrightarrow{AC}$$

Rješenje

a)



$$A(1,2,1),\quad B(2,3,1),\quad C(-2,5,3)$$

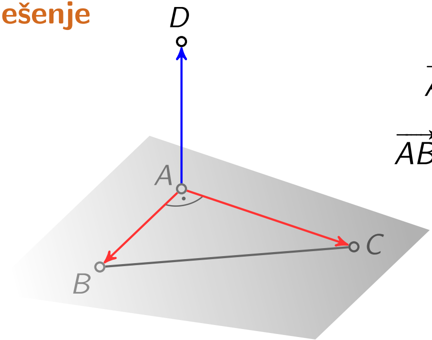
$$\overrightarrow{AB} = (1,1,0) \qquad \overrightarrow{AC} = (-3,3,2)$$

$$\overrightarrow{AB} \cdot \overrightarrow{AC} = 1 \cdot (-3) + 1 \cdot 3 + 0 \cdot 2 = 0$$

$$\overrightarrow{AB} \perp \overrightarrow{AC}$$

Rješenje

a)



$$A(1,2,1), \quad B(2,3,1), \quad C(-2,5,3)$$

$$\overrightarrow{AB} = (1,1,0) \qquad \overrightarrow{AC} = (-3,3,2)$$

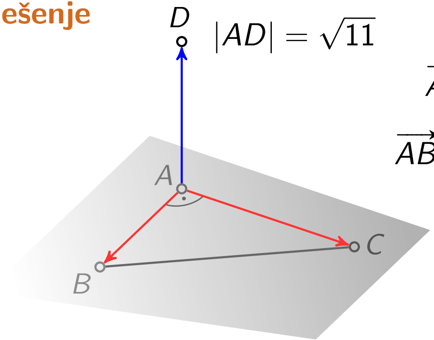
$$\overrightarrow{AB} \cdot \overrightarrow{AC} = 1 \cdot (-3) + 1 \cdot 3 + 0 \cdot 2 = 0$$

$$\overrightarrow{AB} \perp \overrightarrow{AC}$$

b)

Rješenje

a)



$|AD| = \sqrt{11}$

$A(1,2,1), \quad B(2,3,1), \quad C(-2,5,3)$

$\overrightarrow{AB} = (1,1,0) \qquad \overrightarrow{AC} = (-3,3,2)$

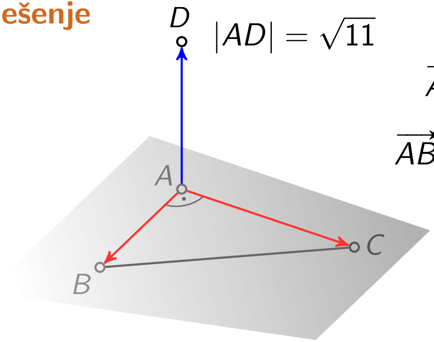
$\overrightarrow{AB} \cdot \overrightarrow{AC} = 1\cdot(-3) + 1\cdot 3 + 0\cdot 2 = 0$

$\overrightarrow{AB} \perp \overrightarrow{AC}$

b)

Rješenje

a)



$|AD| = \sqrt{11}$

$A(1,2,1), \quad B(2,3,1), \quad C(-2,5,3)$

$\overrightarrow{AB} = (1,1,0) \qquad \overrightarrow{AC} = (-3,3,2)$

$\overrightarrow{AB} \cdot \overrightarrow{AC} = 1 \cdot (-3) + 1 \cdot 3 + 0 \cdot 2 = 0$

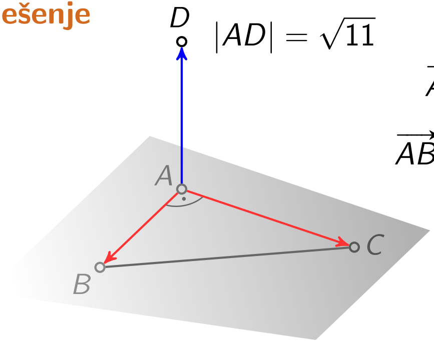
$\overrightarrow{AB} \perp \overrightarrow{AC}$

b)

$\overrightarrow{AD} =$

Rješenje

a)



$$|AD| = \sqrt{11}$$

$$A(1,2,1), \quad B(2,3,1), \quad C(-2,5,3)$$

$$\overrightarrow{AB} = (1,1,0) \qquad \overrightarrow{AC} = (-3,3,2)$$

$$\overrightarrow{AB} \cdot \overrightarrow{AC} = 1 \cdot (-3) + 1 \cdot 3 + 0 \cdot 2 = 0$$

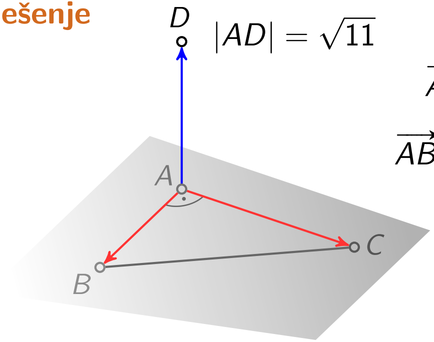
$$\overrightarrow{AB} \perp \overrightarrow{AC}$$

b)

$$\overrightarrow{AD} = \lambda \cdot \left(\overrightarrow{AB} \times \overrightarrow{AC}\right)$$

Rješenje

a)



$|AD| = \sqrt{11}$

$A(1,2,1), \quad B(2,3,1), \quad C(-2,5,3)$

$\overrightarrow{AB} = (1,1,0) \qquad \overrightarrow{AC} = (-3,3,2)$

$\overrightarrow{AB} \cdot \overrightarrow{AC} = 1 \cdot (-3) + 1 \cdot 3 + 0 \cdot 2 = 0$

$\overrightarrow{AB} \perp \overrightarrow{AC}$

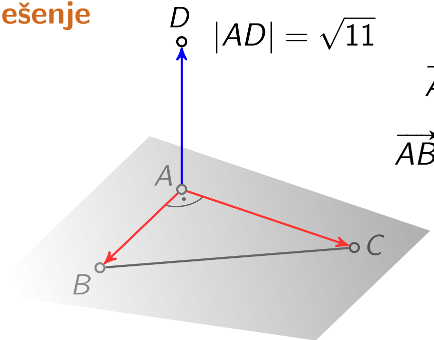
b)

$\overrightarrow{AD} = \lambda \cdot (\overrightarrow{AB} \times \overrightarrow{AC})$

- $(\overrightarrow{AB}, \overrightarrow{AC}, \overrightarrow{AB} \times \overrightarrow{AC})$ je desna baza.

Rješenje

a)



$|AD| = \sqrt{11}$

$A(1,2,1),\quad B(2,3,1),\quad C(-2,5,3)$

$\overrightarrow{AB} = (1,1,0) \qquad \overrightarrow{AC} = (-3,3,2)$

$\overrightarrow{AB} \cdot \overrightarrow{AC} = 1 \cdot (-3) + 1 \cdot 3 + 0 \cdot 2 = 0$

$\overrightarrow{AB} \perp \overrightarrow{AC}$

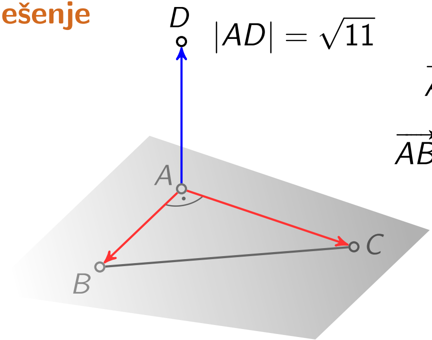
b)

$\overrightarrow{AD} = \lambda \cdot (\overrightarrow{AB} \times \overrightarrow{AC})$

- $(\overrightarrow{AB}, \overrightarrow{AC}, \overrightarrow{AB} \times \overrightarrow{AC})$ je desna baza.
- $(\overrightarrow{AB}, \overrightarrow{AC}, \overrightarrow{AD})$ mora biti desna baza.

Rješenje

a)



$|AD| = \sqrt{11}$

$A(1,2,1),\quad B(2,3,1),\quad C(-2,5,3)$

$\overrightarrow{AB} = (1,1,0) \qquad \overrightarrow{AC} = (-3,3,2)$

$\overrightarrow{AB} \cdot \overrightarrow{AC} = 1 \cdot (-3) + 1 \cdot 3 + 0 \cdot 2 = 0$

$\overrightarrow{AB} \perp \overrightarrow{AC}$

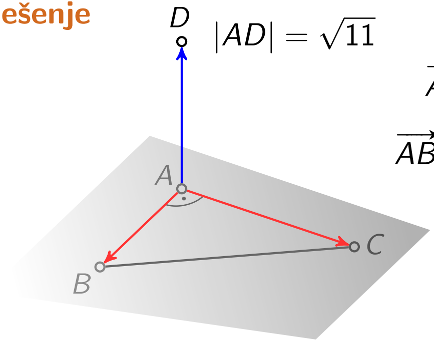
b)

$\overrightarrow{AD} = \lambda \cdot (\overrightarrow{AB} \times \overrightarrow{AC})$

- $(\overrightarrow{AB}, \overrightarrow{AC}, \overrightarrow{AB} \times \overrightarrow{AC})$ je desna baza.
- $(\overrightarrow{AB}, \overrightarrow{AC}, \overrightarrow{AD})$ mora biti desna baza.
- Stoga je $\lambda > 0$.

Rješenje

a)



$|AD| = \sqrt{11}$

$A(1,2,1),\quad B(2,3,1),\quad C(-2,5,3)$

$\overrightarrow{AB} = (1,1,0) \qquad \overrightarrow{AC} = (-3,3,2)$

$\overrightarrow{AB} \cdot \overrightarrow{AC} = 1 \cdot (-3) + 1 \cdot 3 + 0 \cdot 2 = 0$

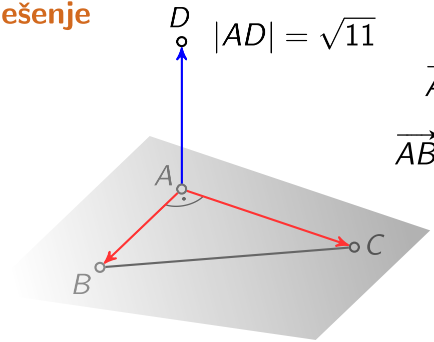
$\overrightarrow{AB} \perp \overrightarrow{AC}$

b)

$\overrightarrow{AD} = \lambda \cdot \left(\overrightarrow{AB} \times \overrightarrow{AC}\right), \quad \lambda > 0$

Rješenje

a)



$|AD| = \sqrt{11}$

$A(1,2,1), \quad B(2,3,1), \quad C(-2,5,3)$

$\overrightarrow{AB} = (1,1,0) \qquad \overrightarrow{AC} = (-3,3,2)$

$\overrightarrow{AB} \cdot \overrightarrow{AC} = 1 \cdot (-3) + 1 \cdot 3 + 0 \cdot 2 = 0$

$\overrightarrow{AB} \perp \overrightarrow{AC}$

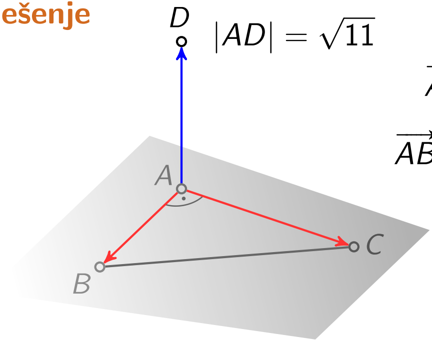
b)

$$\overrightarrow{AD} = \lambda \cdot \left(\overrightarrow{AB} \times \overrightarrow{AC}\right), \quad \lambda > 0$$

$$\overrightarrow{AD} =$$

Rješenje

a)



$|AD| = \sqrt{11}$

$A(1,2,1), \quad B(2,3,1), \quad C(-2,5,3)$

$\overrightarrow{AB} = (1,1,0) \qquad \overrightarrow{AC} = (-3,3,2)$

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$\overrightarrow{AB} \perp \overrightarrow{AC}$

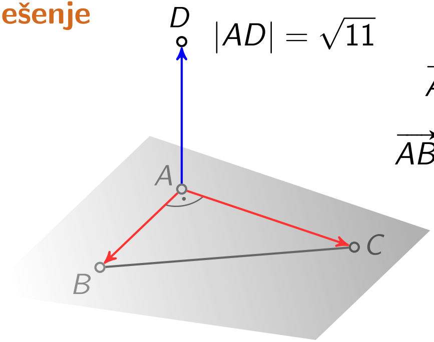
b)

$\overrightarrow{AD} = \lambda \cdot \left(\overrightarrow{AB} \times \overrightarrow{AC}\right), \quad \lambda > 0$

$\overrightarrow{AD} = \underline{\qquad\qquad\qquad}$

Rješenje

a)



$|AD| = \sqrt{11}$

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Rješenje

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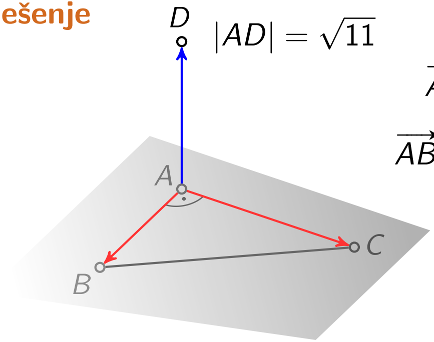

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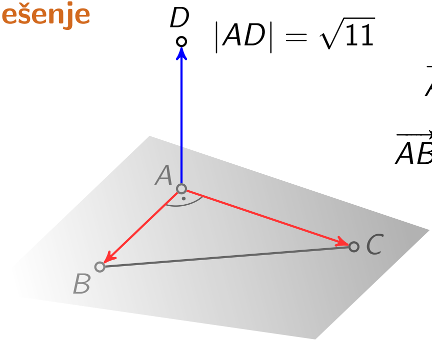
Rješenje

a)



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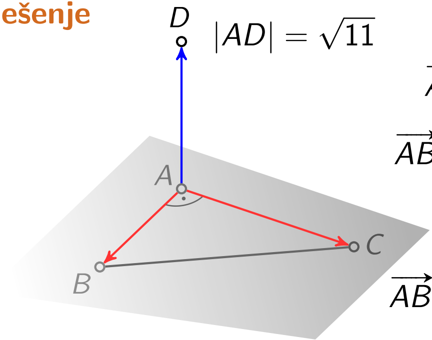
a)



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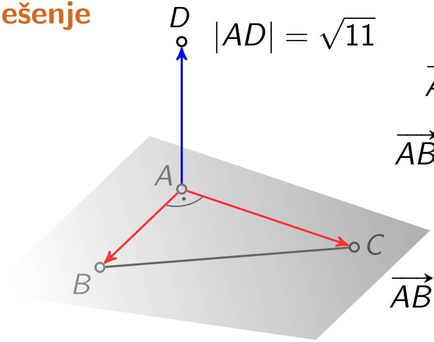

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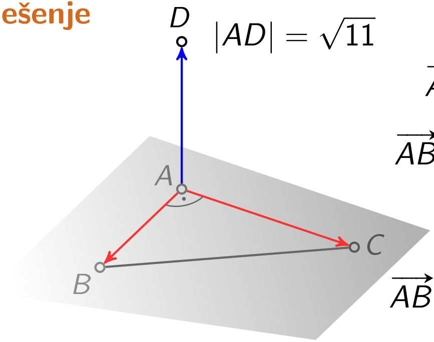
a)



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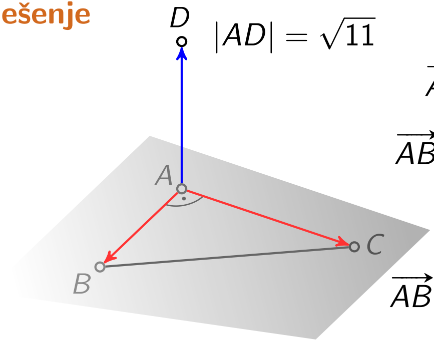

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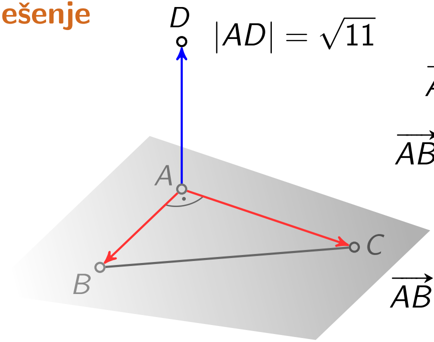

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Rješenje

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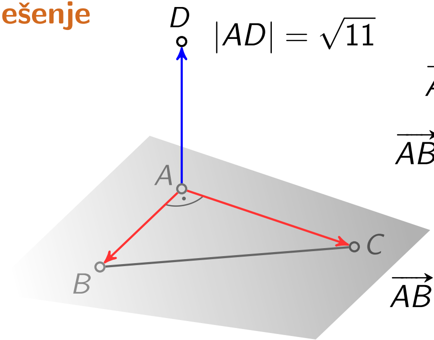

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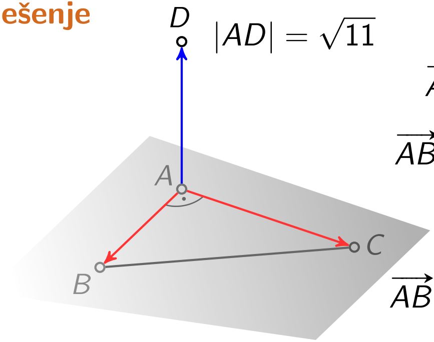
Rješenje

a)



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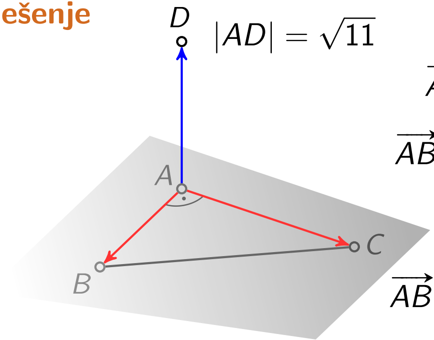

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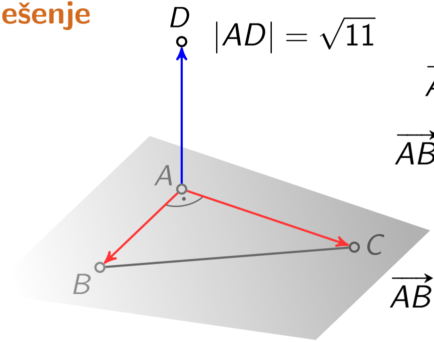

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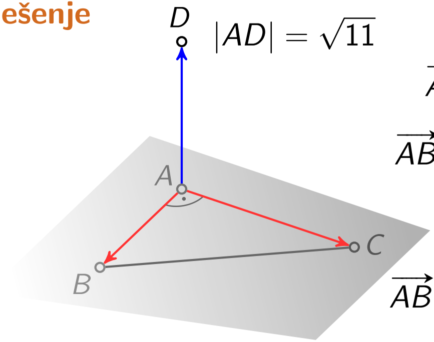

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$$|\overrightarrow{AB} \times \overrightarrow{AC}| = \sqrt{4 + 4 + 36}$$

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Rješenje

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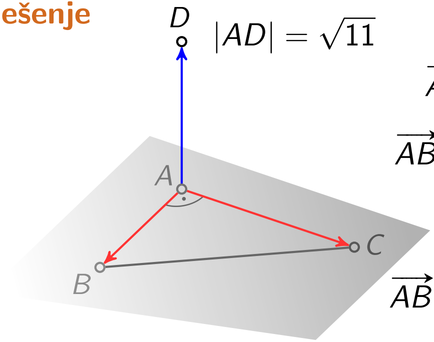

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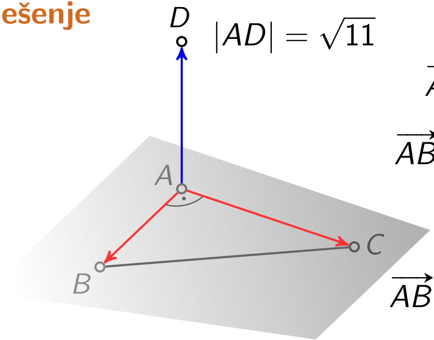

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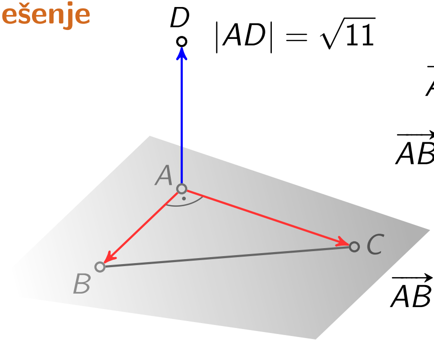

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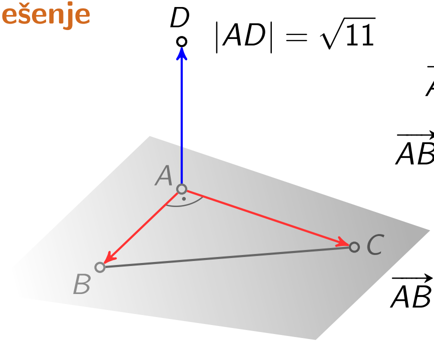

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Rješenje

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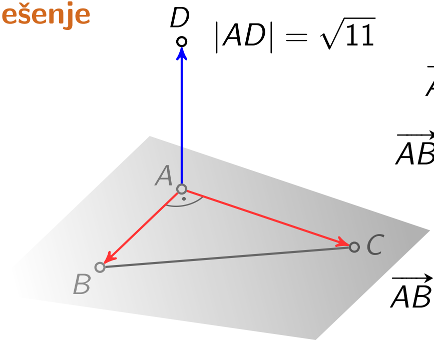

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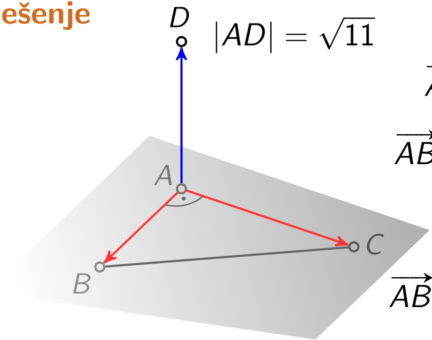

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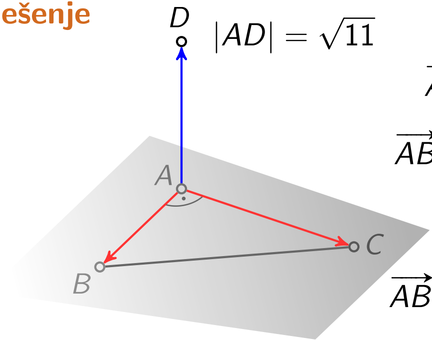

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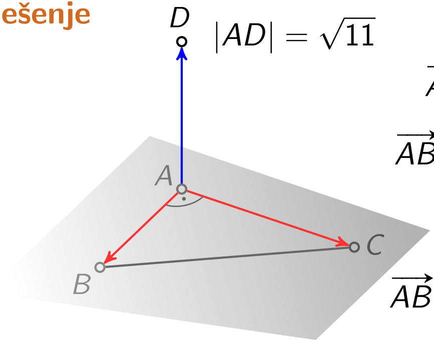

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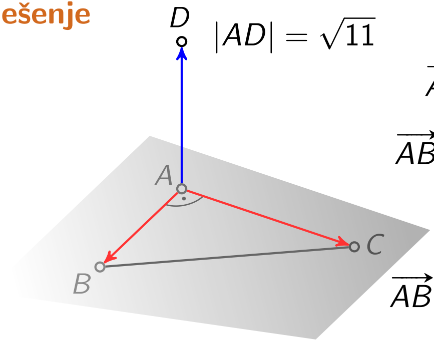
$$\overrightarrow{AD} = \frac{1}{2}$$

Rješenje

a)



$|AD| = \sqrt{11}$

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Rješenje

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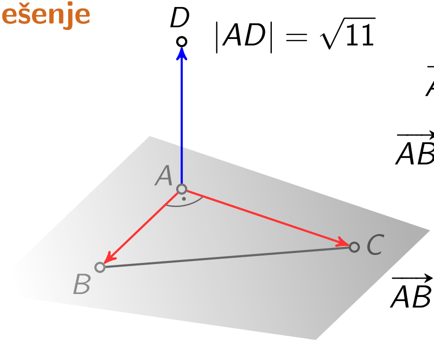

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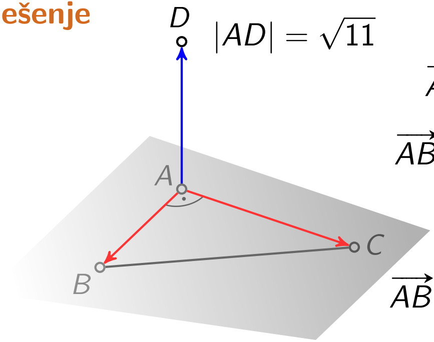
Rješenje

a)



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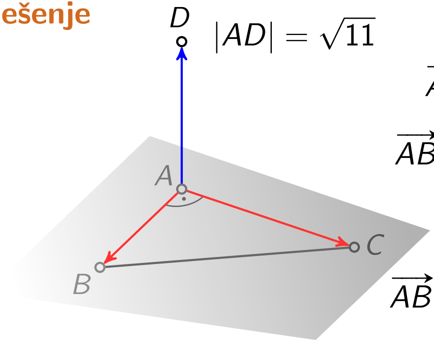
a)



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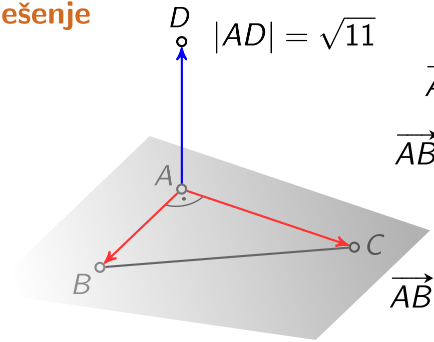
Rješenje

a)



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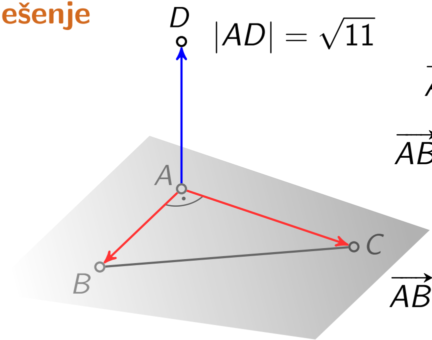
a)



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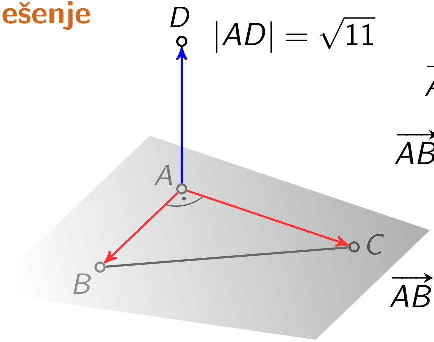
$$\vec{r}_D - \vec{r}_A = (1,-1,3)$$

Rješenje

a)



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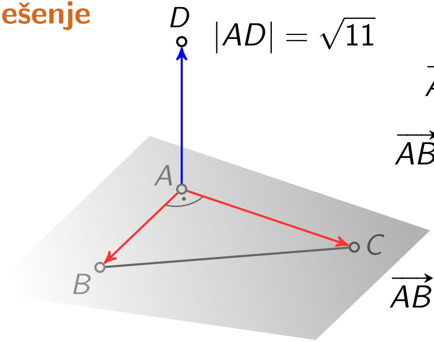
Rješenje

a)



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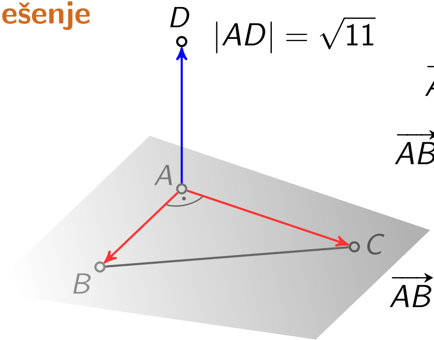
Rješenje

a)



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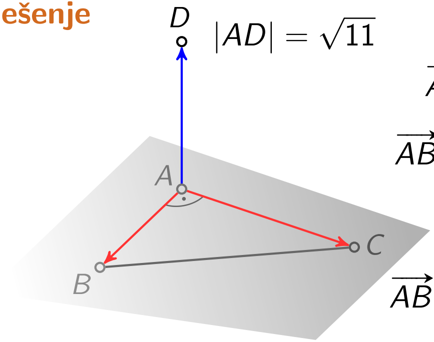
Rješenje

a)



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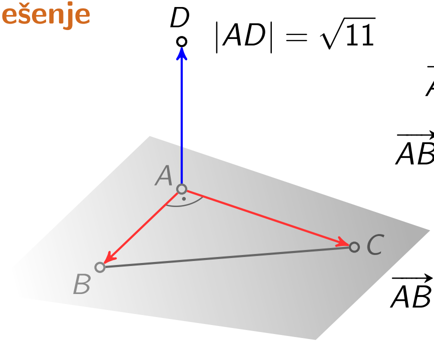
Rješenje

a)



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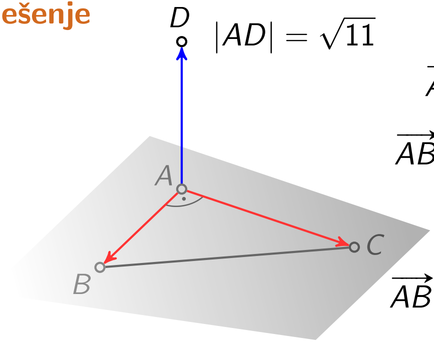
Rješenje

a)



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$\vec{r}_D - \vec{r}_A = (1,-1,3)$

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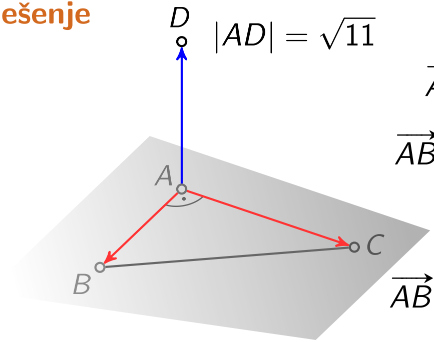
$\vec{r}_D =$

Rješenje

a)



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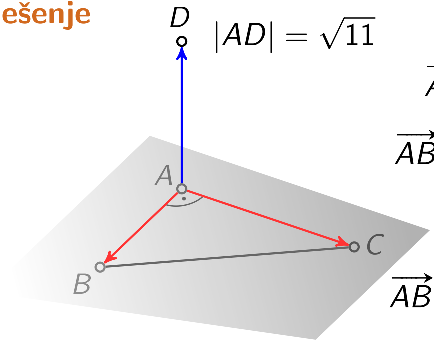
$$\vec{r}_D = \vec{r}_A + (1, -1, 3)$$

$$\vec{r}_D = (1,2,1) + (1, -1, 3)$$

$$\vec{r}_D = (2, 1, 4)$$

Rješenje

a)



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$$\vec{r}_D - \vec{r}_A = (1,-1,3)$$

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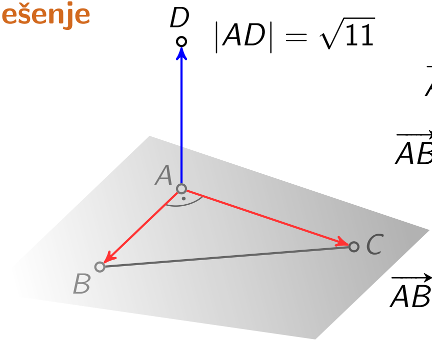
$$\vec{r}_D = (1,2,1) + (1,-1,3)$$

$$\vec{r}_D = (2,1,4)$$

$$D(2,1,4)$$

Rješenje

a)



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$$\overrightarrow{AD} = (1,-1,3)$$

$$\vec{r}_D - \vec{r}_A = (1,-1,3)$$

$$\vec{r}_D = \vec{r}_A + (1,-1,3)$$

$$\vec{r}_D = (1,2,1) + (1,-1,3)$$

$$\vec{r}_D = (2,1,4)$$

$$\boxed{D(2,1,4)}$$

četvrti zadatak

Zadatak 4

Zadana je dužina $\overline{AB}$ *s koordinatama svojih krajeva* $A(3,4,1)$ *i* $B(-5,2,-3)$.

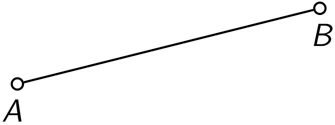
a) *Točkama* C_1, C_2 *i* C_3 *dužina* $\overline{AB}$ *je podijeljena na četiri jednaka dijela. Odredite koordinate točaka* C_1, C_2 *i* C_3.

b) *Odredite na pravcu* AB *točku* D *za koju je točka* A *polovište dužine* $\overline{C_1 D}$.

Rješenje

a)

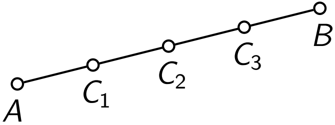
$A(3, 4, 1) \qquad B(-5, 2, -3)$



Rješenje

a)

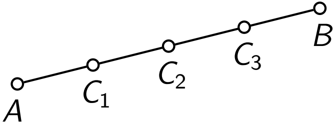
$A(3, 4, 1) \qquad B(-5, 2, -3)$



Rješenje

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

a)

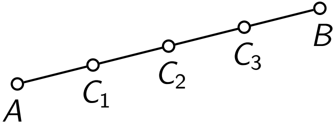


$$\overrightarrow{AB} =$$

Rješenje

a)

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



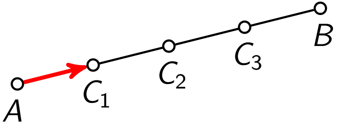
$$\overrightarrow{AB} = (-8, -2, -4)$$

Rješenje

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

a)

$\overrightarrow{AC_1} =$



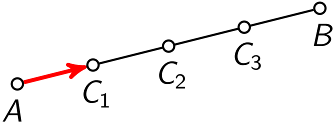
$\overrightarrow{AB} = (-8, -2, -4)$

Rješenje

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

a)

$$\overrightarrow{AC_1} = \frac{1}{4}\overrightarrow{AB}$$

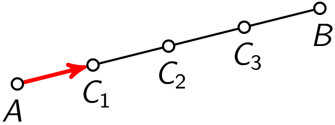


$$\overrightarrow{AB} = (-8, -2, -4)$$

Rješenje

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

a)



$$\overrightarrow{AC_1} = \frac{1}{4}\overrightarrow{AB}$$

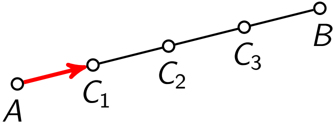
$$\vec{r}_{C_1} - \vec{r}_A$$

$$\overrightarrow{AB} = (-8, -2, -4)$$

Rješenje

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

a)



$$\overrightarrow{AC_1} = \frac{1}{4}\overrightarrow{AB}$$

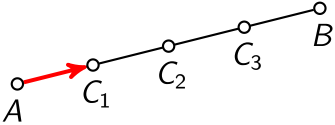
$$\vec{r}_{C_1} - \vec{r}_A = \frac{1}{4}\overrightarrow{AB}$$

$$\overrightarrow{AB} = (-8, -2, -4)$$

Rješenje

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

a)



$$\overrightarrow{AC_1} = \frac{1}{4}\overrightarrow{AB}$$

$$\vec{r}_{C_1} - \vec{r}_A = \frac{1}{4}\overrightarrow{AB}$$

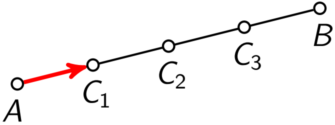
$$\vec{r}_{C_1} =$$

$$\overrightarrow{AB} = (-8, -2, -4)$$

Rješenje

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

a)



$$\overrightarrow{AC_1} = \frac{1}{4}\overrightarrow{AB}$$

$$\vec{r}_{C_1} - \vec{r}_A = \frac{1}{4}\overrightarrow{AB}$$

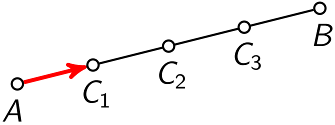
$$\vec{r}_{C_1} = \vec{r}_A + \frac{1}{4}\overrightarrow{AB}$$

$$\overrightarrow{AB} = (-8, -2, -4)$$

Rješenje

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

a)



$$\overrightarrow{AC_1} = \frac{1}{4}\overrightarrow{AB}$$

$$\vec{r}_{C_1} - \vec{r}_A = \frac{1}{4}\overrightarrow{AB}$$

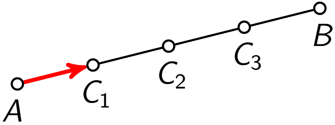
$$\boxed{\vec{r}_{C_1} = \vec{r}_A + \frac{1}{4}\overrightarrow{AB}}$$

$$\overrightarrow{AB} = (-8,-2,-4)$$

Rješenje

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

a)



$$\overrightarrow{AC_1} = \frac{1}{4}\overrightarrow{AB}$$

$$\vec{r}_{C_1} - \vec{r}_A = \frac{1}{4}\overrightarrow{AB}$$

$$\boxed{\vec{r}_{C_1} = \vec{r}_A + \frac{1}{4}\overrightarrow{AB}}$$

$$\overrightarrow{AB} = (-8,-2,-4)$$

$$\vec{r}_{C_1} =$$

Rješenje

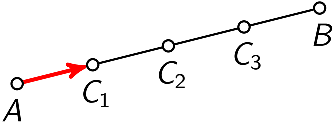
$A(3, 4, 1) \qquad B(-5, 2, -3)$

a)

$$\overrightarrow{AC_1} = \frac{1}{4}\overrightarrow{AB}$$

$$\vec{r}_{C_1} - \vec{r}_A = \frac{1}{4}\overrightarrow{AB}$$

$$\boxed{\vec{r}_{C_1} = \vec{r}_A + \frac{1}{4}\overrightarrow{AB}}$$



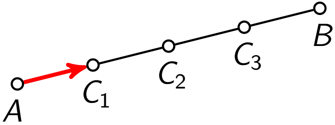
$$\overrightarrow{AB} = (-8, -2, -4)$$

$$\vec{r}_{C_1} = (3, 4, 1)$$

Rješenje

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

a)



$$\overrightarrow{AC_1} = \frac{1}{4}\overrightarrow{AB}$$

$$\vec{r}_{C_1} - \vec{r}_A = \frac{1}{4}\overrightarrow{AB}$$

$$\boxed{\vec{r}_{C_1} = \vec{r}_A + \frac{1}{4}\overrightarrow{AB}}$$

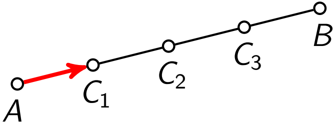
$$\overrightarrow{AB} = (-8,-2,-4)$$

$$\vec{r}_{C_1} = (3,4,1) + \frac{1}{4}\cdot$$

Rješenje

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

a)



$$\overrightarrow{AC_1} = \frac{1}{4}\overrightarrow{AB}$$

$$\vec{r}_{C_1} - \vec{r}_A = \frac{1}{4}\overrightarrow{AB}$$

$$\boxed{\vec{r}_{C_1} = \vec{r}_A + \frac{1}{4}\overrightarrow{AB}}$$

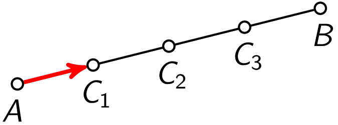
$$\overrightarrow{AB} = (-8,-2,-4)$$

$$\vec{r}_{C_1} = (3,4,1) + \frac{1}{4}\cdot(-8,-2,-4)$$

Rješenje

a)

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



$$\overrightarrow{AC_1} = \frac{1}{4}\overrightarrow{AB}$$

$$\vec{r}_{C_1} - \vec{r}_A = \frac{1}{4}\overrightarrow{AB}$$

$$\boxed{\vec{r}_{C_1} = \vec{r}_A + \frac{1}{4}\overrightarrow{AB}}$$

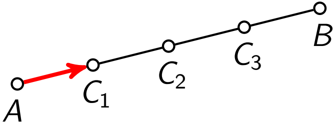
$$\overrightarrow{AB} = (-8, -2, -4)$$

$$\vec{r}_{C_1} = (3, 4, 1) + \frac{1}{4} \cdot (-8, -2, -4)$$

$$\vec{r}_{C_1} =$$

Rješenje

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



a)

$$\overrightarrow{AC_1} = \frac{1}{4}\overrightarrow{AB}$$

$$\vec{r}_{C_1} - \vec{r}_A = \frac{1}{4}\overrightarrow{AB}$$

$$\boxed{\vec{r}_{C_1} = \vec{r}_A + \frac{1}{4}\overrightarrow{AB}}$$

$$\overrightarrow{AB} = (-8,-2,-4)$$

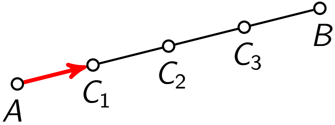
$$\vec{r}_{C_1} = (3,4,1) + \frac{1}{4}\cdot(-8,-2,-4)$$

$$\vec{r}_{C_1} = (3,4,1) +$$

Rješenje

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

a)



$$\overrightarrow{AC_1} = \frac{1}{4}\overrightarrow{AB}$$

$$\vec{r}_{C_1} - \vec{r}_A = \frac{1}{4}\overrightarrow{AB}$$

$$\boxed{\vec{r}_{C_1} = \vec{r}_A + \frac{1}{4}\overrightarrow{AB}}$$

$$\overrightarrow{AB} = (-8, -2, -4)$$

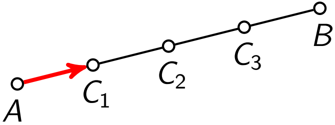
$$\vec{r}_{C_1} = (3, 4, 1) + \frac{1}{4} \cdot (-8, -2, -4)$$

$$\vec{r}_{C_1} = (3, 4, 1) + \left(-2, -\frac{1}{2}, -1\right)$$

Rješenje

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

a)



$$\overrightarrow{AC_1} = \frac{1}{4}\overrightarrow{AB}$$

$$\vec{r}_{C_1} - \vec{r}_A = \frac{1}{4}\overrightarrow{AB}$$

$$\boxed{\vec{r}_{C_1} = \vec{r}_A + \frac{1}{4}\overrightarrow{AB}}$$

$$\overrightarrow{AB} = (-8,-2,-4)$$

$$\vec{r}_{C_1} = (3,4,1) + \frac{1}{4}\cdot(-8,-2,-4)$$

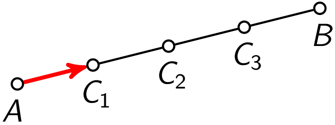
$$\vec{r}_{C_1} = (3,4,1) + \left(-2,-\frac{1}{2},-1\right)$$

$$\vec{r}_{C_1} =$$

Rješenje

a)

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



$$\overrightarrow{AC_1} = \frac{1}{4}\overrightarrow{AB}$$

$$\vec{r}_{C_1} - \vec{r}_A = \frac{1}{4}\overrightarrow{AB}$$

$$\boxed{\vec{r}_{C_1} = \vec{r}_A + \frac{1}{4}\overrightarrow{AB}}$$

$$\overrightarrow{AB} = (-8,-2,-4)$$

$$\vec{r}_{C_1} = (3,4,1) + \frac{1}{4}\cdot(-8,-2,-4)$$

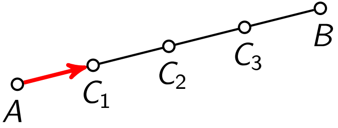
$$\vec{r}_{C_1} = (3,4,1) + \left(-2,-\frac{1}{2},-1\right)$$

$$\vec{r}_{C_1} = \left(1,\frac{7}{2},0\right)$$

Rješenje

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

a)



$$\overrightarrow{AC_1} = \frac{1}{4}\overrightarrow{AB}$$

$$\vec{r}_{C_1} - \vec{r}_A = \frac{1}{4}\overrightarrow{AB}$$

$$\boxed{\vec{r}_{C_1} = \vec{r}_A + \frac{1}{4}\overrightarrow{AB}}$$

$$\overrightarrow{AB} = (-8,-2,-4)$$

$$\vec{r}_{C_1} = (3,4,1) + \frac{1}{4}\cdot(-8,-2,-4)$$

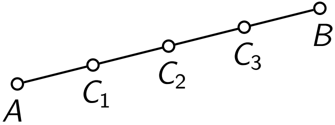
$$\vec{r}_{C_1} = (3,4,1) + \left(-2,-\frac{1}{2},-1\right)$$

$$\vec{r}_{C_1} = \left(1,\frac{7}{2},0\right)$$

$$C_1\left(1,\frac{7}{2},0\right)$$

a)

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



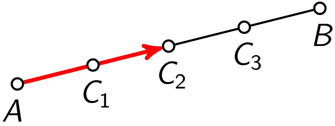
$$\overrightarrow{AB} = (-8,-2,-4)$$

$$C_1\left(1,\frac{7}{2},0\right)$$

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

a)

$\overrightarrow{AC_2} =$



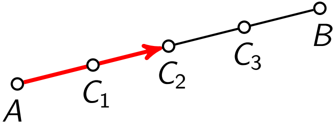
$\overrightarrow{AB} = (-8, -2, -4)$

$C_1\left(1, \frac{7}{2}, 0\right)$

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

a)

$$\overrightarrow{AC_2} = \frac{1}{2}\overrightarrow{AB}$$

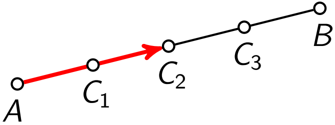


$$\overrightarrow{AB} = (-8, -2, -4)$$

$$C_1\left(1, \frac{7}{2}, 0\right)$$

a)

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



$$\overrightarrow{AC_2} = \frac{1}{2}\overrightarrow{AB}$$

$$\vec{r}_{C_2} - \vec{r}_A$$

$$\overrightarrow{AB} = (-8, -2, -4)$$

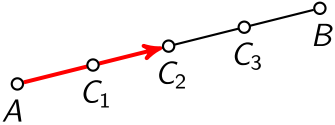
$$C_1\left(1, \frac{7}{2}, 0\right)$$

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

a)

$$\overrightarrow{AC_2} = \frac{1}{2}\overrightarrow{AB}$$

$$\vec{r}_{C_2} - \vec{r}_A = \frac{1}{2}\overrightarrow{AB}$$

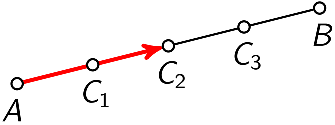


$$\overrightarrow{AB} = (-8, -2, -4)$$

$$C_1\left(1, \frac{7}{2}, 0\right)$$

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

a)



$$\overrightarrow{AC_2} = \frac{1}{2}\overrightarrow{AB}$$

$$\vec{r}_{C_2} - \vec{r}_A = \frac{1}{2}\overrightarrow{AB}$$

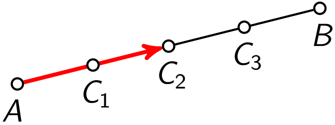
$$\vec{r}_{C_2} =$$

$$\overrightarrow{AB} = (-8, -2, -4)$$

$$C_1\left(1, \frac{7}{2}, 0\right)$$

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

a)



$$\overrightarrow{AC_2} = \frac{1}{2}\overrightarrow{AB}$$

$$\vec{r}_{C_2} - \vec{r}_A = \frac{1}{2}\overrightarrow{AB}$$

$$\vec{r}_{C_2} = \vec{r}_A + \frac{1}{2}\overrightarrow{AB}$$

$$\overrightarrow{AB} = (-8, -2, -4)$$

$$C_1\left(1, \frac{7}{2}, 0\right)$$

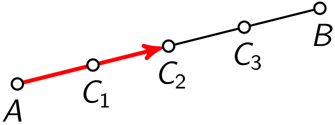
$A(3,4,1) \qquad B(-5,2,-3)$

a)

$$\overrightarrow{AC_2} = \frac{1}{2}\overrightarrow{AB}$$

$$\vec{r}_{C_2} - \vec{r}_A = \frac{1}{2}\overrightarrow{AB}$$

$$\boxed{\vec{r}_{C_2} = \vec{r}_A + \frac{1}{2}\overrightarrow{AB}}$$

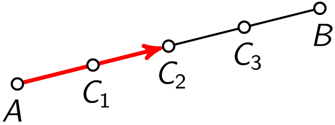


$$\overrightarrow{AB} = (-8,-2,-4)$$

$$C_1\left(1, \frac{7}{2}, 0\right)$$

a)

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



$$\overrightarrow{AC_2} = \frac{1}{2}\overrightarrow{AB}$$

$$\vec{r}_{C_2} - \vec{r}_A = \frac{1}{2}\overrightarrow{AB}$$

$$\boxed{\vec{r}_{C_2} = \vec{r}_A + \frac{1}{2}\overrightarrow{AB}}$$

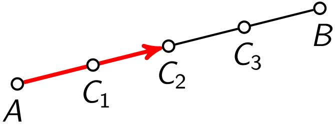
$$\overrightarrow{AB} = (-8, -2, -4)$$

$$C_1\left(1, \frac{7}{2}, 0\right)$$

$$\vec{r}_{C_2} =$$

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

a)



$$\overrightarrow{AC_2} = \frac{1}{2}\overrightarrow{AB}$$

$$\vec{r}_{C_2} - \vec{r}_A = \frac{1}{2}\overrightarrow{AB}$$

$$\boxed{\vec{r}_{C_2} = \vec{r}_A + \frac{1}{2}\overrightarrow{AB}}$$

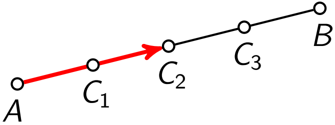
$$\overrightarrow{AB} = (-8,-2,-4)$$

$$C_1\left(1, \frac{7}{2}, 0\right)$$

$$\vec{r}_{C_2} = (3,4,1)$$

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

a)



$$\overrightarrow{AC_2} = \frac{1}{2}\overrightarrow{AB}$$

$$\vec{r}_{C_2} - \vec{r}_A = \frac{1}{2}\overrightarrow{AB}$$

$$\boxed{\vec{r}_{C_2} = \vec{r}_A + \frac{1}{2}\overrightarrow{AB}}$$

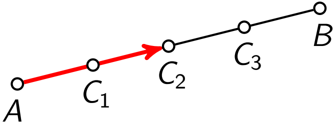
$$\overrightarrow{AB} = (-8, -2, -4)$$

$$C_1\left(1, \frac{7}{2}, 0\right)$$

$$\vec{r}_{C_2} = (3, 4, 1) + \frac{1}{2} \cdot$$

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

a)



$$\overrightarrow{AC_2} = \frac{1}{2}\overrightarrow{AB}$$

$$\vec{r}_{C_2} - \vec{r}_A = \frac{1}{2}\overrightarrow{AB}$$

$$\boxed{\vec{r}_{C_2} = \vec{r}_A + \frac{1}{2}\overrightarrow{AB}}$$

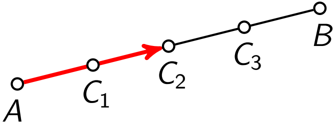
$$\overrightarrow{AB} = (-8,-2,-4)$$

$$C_1\left(1, \frac{7}{2}, 0\right)$$

$$\vec{r}_{C_2} = (3,4,1) + \frac{1}{2}\cdot(-8,-2,-4)$$

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

a)



$$\overrightarrow{AC_2} = \frac{1}{2}\overrightarrow{AB}$$

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$$\boxed{\vec{r}_{C_2} = \vec{r}_A + \frac{1}{2}\overrightarrow{AB}}$$

$$\overrightarrow{AB} = (-8,-2,-4)$$

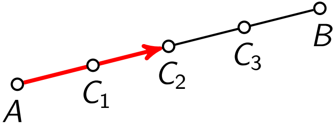
$$C_1\left(1, \frac{7}{2}, 0\right)$$

$$\vec{r}_{C_2} = (3,4,1) + \frac{1}{2}\cdot(-8,-2,-4)$$

$$\vec{r}_{C_2} =$$

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

a)



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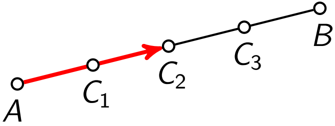

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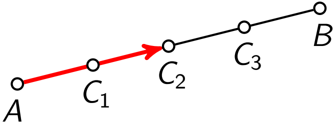

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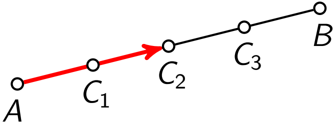

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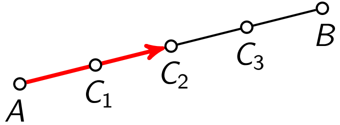

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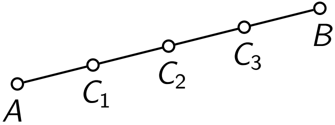

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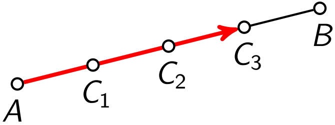

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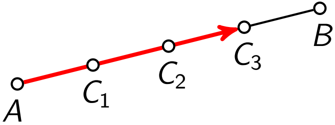

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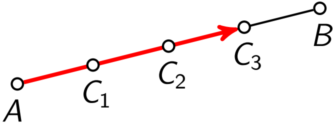

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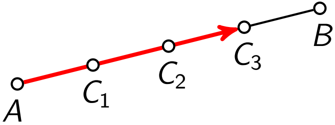

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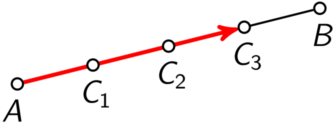

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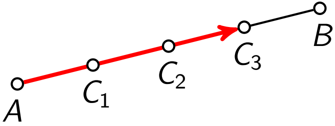

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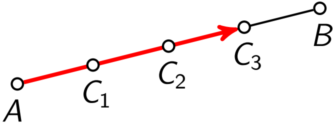

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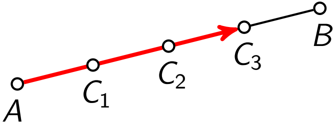

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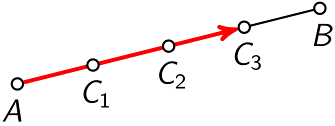

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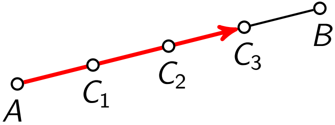

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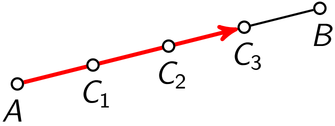

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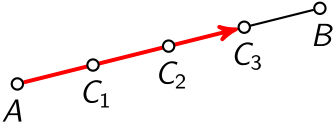

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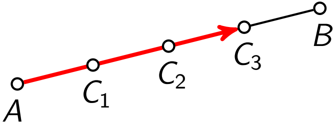

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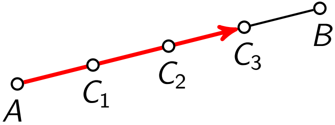

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$A(3, 4, 1) \qquad B(-5, 2, -3)$

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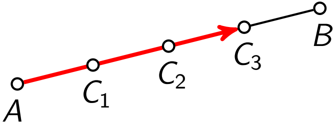

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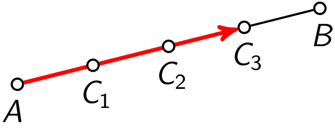

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$A(3, 4, 1) \qquad B(-5, 2, -3)$

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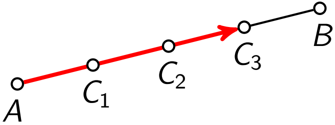

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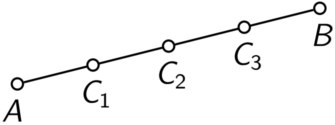
$$C_1\left(1, \frac{7}{2}, 0\right)$$

$$C_2(-1, 3, -1)$$

$$C_3\left(-3, \frac{5}{2}, -2\right)$$

b)

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



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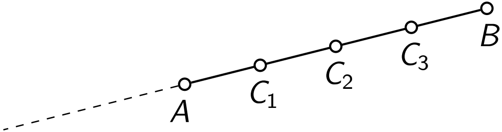

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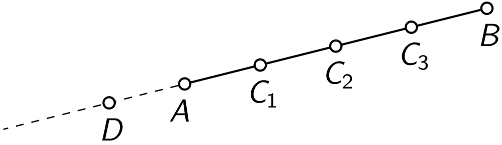

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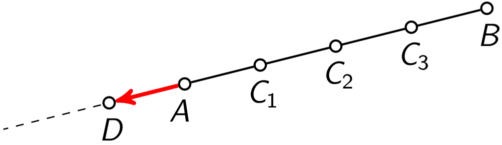
$\overrightarrow{AD} =$



$$\overrightarrow{AB} = (-8, -2, -4)$$

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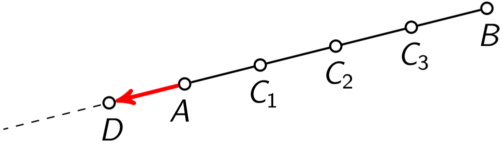
$$C_2(-1, 3, -1)$$

$$C_3\left(-3, \frac{5}{2}, -2\right)$$

b)

$$\overrightarrow{AD} = -\frac{1}{4}\overrightarrow{AB}$$

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



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$$C_1\left(1,\frac{7}{2},0\right)$$

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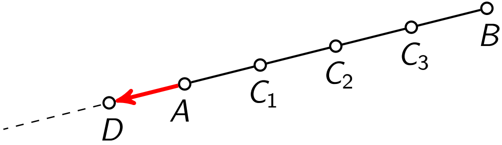
$$\vec{r}_D - \vec{r}_A$$

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



$$\overrightarrow{AB} = (-8, -2, -4)$$

$$C_1\left(1, \frac{7}{2}, 0\right)$$

$$C_2(-1, 3, -1)$$

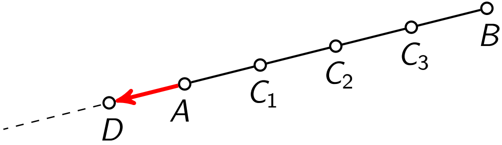
$$C_3\left(-3, \frac{5}{2}, -2\right)$$

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

b)

$$\overrightarrow{AD} = -\frac{1}{4}\overrightarrow{AB}$$

$$\vec{r}_D - \vec{r}_A = -\frac{1}{4}\overrightarrow{AB}$$



$$\overrightarrow{AB} = (-8,-2,-4)$$

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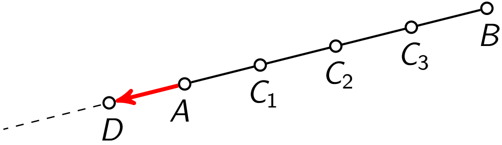
$A(3, 4, 1) \qquad B(-5, 2, -3)$

b)



$$\overrightarrow{AD} = -\frac{1}{4}\overrightarrow{AB}$$

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$$\vec{r}_D =$$

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$$C_1\left(1, \frac{7}{2}, 0\right)$$

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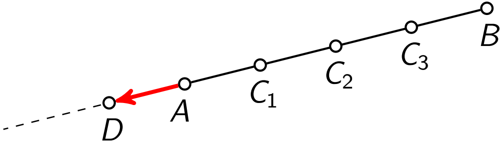
$$A(3,4,1) \qquad B(-5,2,-3)$$

$$\overrightarrow{AD} = -\frac{1}{4}\overrightarrow{AB}$$

$$\vec{r}_D - \vec{r}_A = -\frac{1}{4}\overrightarrow{AB}$$

$$\vec{r}_D = \vec{r}_A - \frac{1}{4}\overrightarrow{AB}$$



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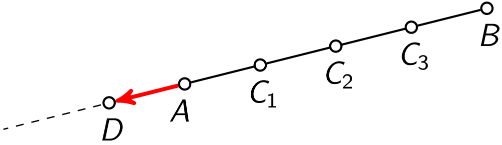
b)

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

$$\overrightarrow{AD} = -\frac{1}{4}\overrightarrow{AB}$$

$$\vec{r}_D - \vec{r}_A = -\frac{1}{4}\overrightarrow{AB}$$

$$\boxed{\vec{r}_D = \vec{r}_A - \frac{1}{4}\overrightarrow{AB}}$$



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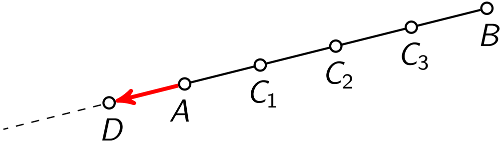
$A(3, 4, 1) \qquad B(-5, 2, -3)$

b)



$$\overrightarrow{AD} = -\frac{1}{4}\overrightarrow{AB}$$

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$$\overrightarrow{AB} = (-8, -2, -4)$$

$$C_1\left(1, \frac{7}{2}, 0\right)$$

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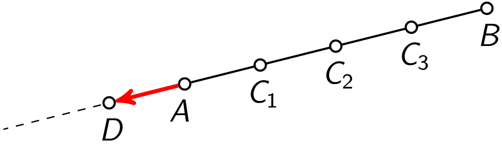
$$\vec{r}_D =$$

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

b)

$$\overrightarrow{AD} = -\frac{1}{4}\overrightarrow{AB}$$



$$\vec{r}_D - \vec{r}_A = -\frac{1}{4}\overrightarrow{AB}$$

$$\boxed{\vec{r}_D = \vec{r}_A - \frac{1}{4}\overrightarrow{AB}}$$

$$\overrightarrow{AB} = (-8, -2, -4)$$

$$C_1\left(1, \frac{7}{2}, 0\right)$$

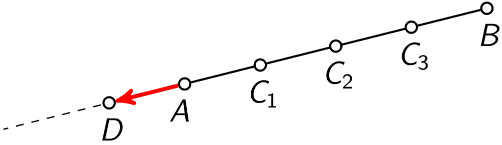
$$\vec{r}_D = (3, 4, 1)$$

$$C_2(-1, 3, -1)$$

$$C_3\left(-3, \frac{5}{2}, -2\right)$$

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

b)



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$$\vec{r}_D - \vec{r}_A = -\frac{1}{4}\overrightarrow{AB}$$

$$\boxed{\vec{r}_D = \vec{r}_A - \frac{1}{4}\overrightarrow{AB}}$$

$$\vec{r}_D = (3,4,1) - \frac{1}{4}\cdot$$

$$\overrightarrow{AB} = (-8,-2,-4)$$

$$C_1\left(1, \frac{7}{2}, 0\right)$$

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

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$$\overrightarrow{AD} = -\tfrac{1}{4}\overrightarrow{AB}$$

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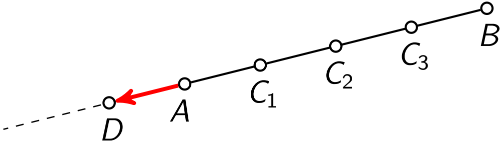

$$\overrightarrow{AB} = (-8,-2,-4)$$

$$\vec{r}_D = (3,4,1) - \frac{1}{4}\cdot(-8,-2,-4)$$

$$C_1\left(1, \frac{7}{2}, 0\right)$$

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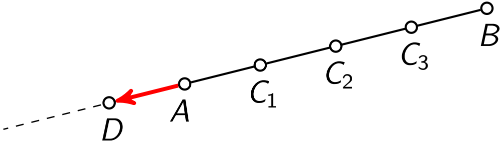

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$$\vec{r}_D = (3,4,1) - \frac{1}{4}\cdot(-8,-2,-4)$$

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$$C_3\left(-3, \frac{5}{2}, -2\right)$$

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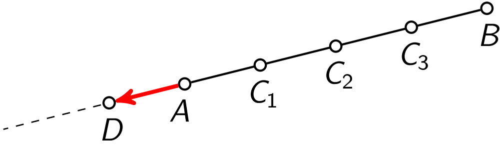

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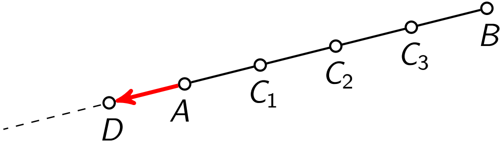
$$\vec{r}_D = (3,4,1) - \frac{1}{4}\cdot(-8,-2,-4)$$

$$\vec{r}_D = (3,4,1) +$$

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

b)



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$$\overrightarrow{AB} = (-8,-2,-4)$$

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$$C_2(-1,3,-1)$$

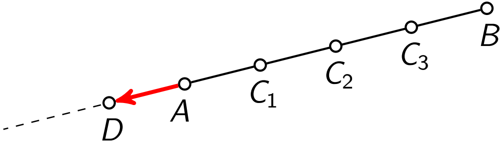
$$C_3\left(-3, \frac{5}{2}, -2\right)$$

$$\vec{r}_D = (3,4,1) - \frac{1}{4}\cdot(-8,-2,-4)$$

$$\vec{r}_D = (3,4,1) + \left(2, \frac{1}{2}, 1\right)$$

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

b)



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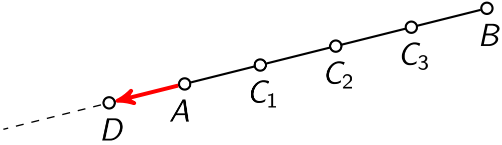

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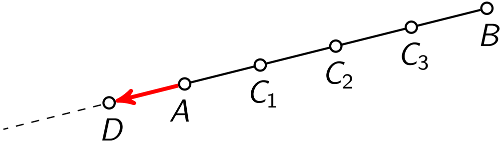
$$\vec{r}_D = (3, 4, 1) - \frac{1}{4} \cdot (-8, -2, -4)$$

$$\vec{r}_D = (3, 4, 1) + \left(2, \frac{1}{2}, 1\right)$$

$$\vec{r}_D = \left(5, \frac{9}{2}, 2\right)$$

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

b)



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$$\overrightarrow{AB} = (-8, -2, -4)$$

$$C_1\left(1, \frac{7}{2}, 0\right)$$

$$C_2(-1, 3, -1)$$

$$C_3\left(-3, \frac{5}{2}, -2\right)$$

$$D\left(5, \frac{9}{2}, 2\right)$$

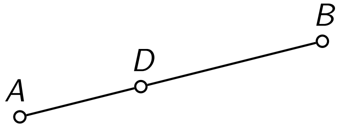
$$\vec{r}_D = (3, 4, 1) - \frac{1}{4} \cdot (-8, -2, -4)$$

$$\vec{r}_D = (3, 4, 1) + \left(2, \frac{1}{2}, 1\right)$$

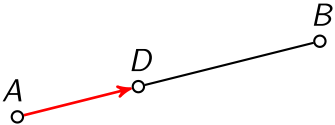
$$\vec{r}_D = \left(5, \frac{9}{2}, 2\right)$$

Koordinate djelišne točke

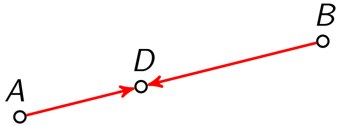
Koordinate djelišne točke – 1. pristup



Koordinate djelišne točke – 1. pristup

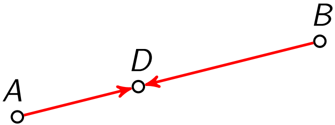


Koordinate djelišne točke – 1. pristup



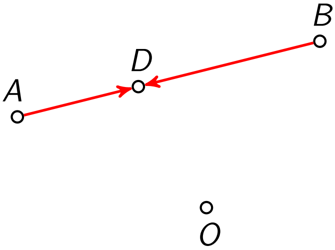
Koordinate djelišne točke – 1. pristup

$$\overrightarrow{AD} = \lambda \overrightarrow{BD}$$



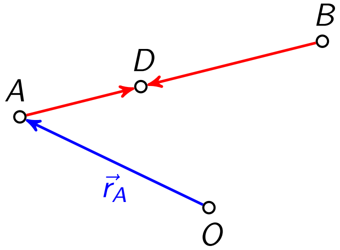
Koordinate djelišne točke – 1. pristup

$$\overrightarrow{AD} = \lambda \overrightarrow{BD}$$



Koordinate djelišne točke – 1. pristup

$$\overrightarrow{AD} = \lambda \overrightarrow{BD}$$



Koordinate djelišne točke – 1. pristup

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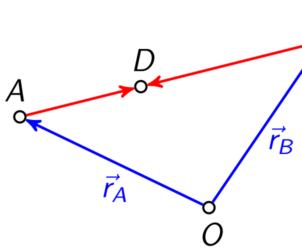

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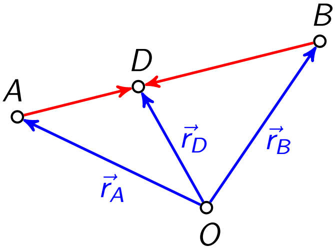
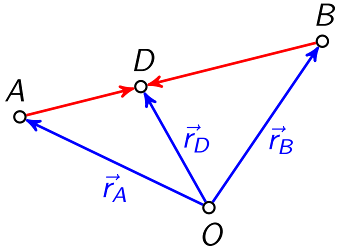


Koordinate djelišne točke – 1. pristup

$$\overrightarrow{AD} = \lambda \overrightarrow{BD}$$

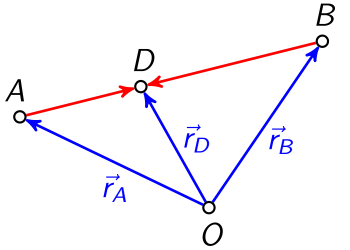
$$\vec{r}_D - \vec{r}_A =$$



Koordinate djelišne točke – 1. pristup

$$\overrightarrow{AD} = \lambda \overrightarrow{BD}$$

$$\vec{r}_D - \vec{r}_A = \lambda\big(\vec{r}_D - \vec{r}_B\big)$$

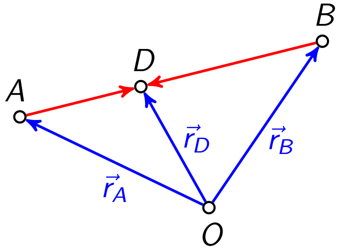


Koordinate djelišne točke – 1. pristup

$$\overrightarrow{AD} = \lambda \overrightarrow{BD}$$

$$\vec{r}_D - \vec{r}_A = \lambda\big(\vec{r}_D - \vec{r}_B\big)$$

$$\vec{r}_D - \vec{r}_A =$$

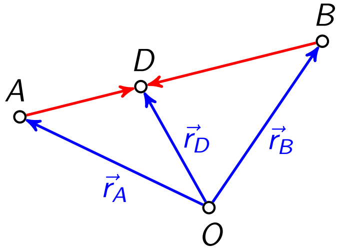


Koordinate djelišne točke – 1. pristup

$$\overrightarrow{AD} = \lambda \overrightarrow{BD}$$

$$\vec{r}_D - \vec{r}_A = \lambda\left(\vec{r}_D - \vec{r}_B\right)$$

$$\vec{r}_D - \vec{r}_A = \lambda\vec{r}_D - \lambda\vec{r}_B$$



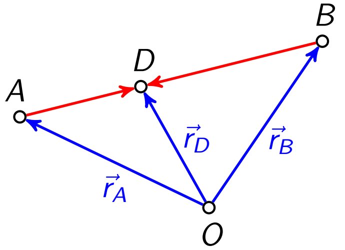
Koordinate djelišne točke – 1. pristup

$$\overrightarrow{AD} = \lambda \overrightarrow{BD}$$

$$\vec{r}_D - \vec{r}_A = \lambda\big(\vec{r}_D - \vec{r}_B\big)$$

$$\vec{r}_D - \vec{r}_A = \lambda \vec{r}_D - \lambda \vec{r}_B$$

$$\vec{r}_D - \lambda \vec{r}_D =$$



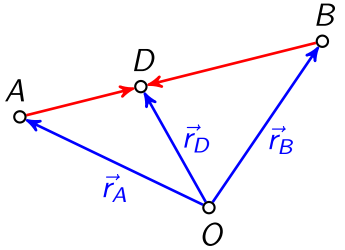
Koordinate djelišne točke – 1. pristup

$$\overrightarrow{AD} = \lambda \overrightarrow{BD}$$

$$\vec{r}_D - \vec{r}_A = \lambda\big(\vec{r}_D - \vec{r}_B\big)$$

$$\vec{r}_D - \vec{r}_A = \lambda\vec{r}_D - \lambda\vec{r}_B$$

$$\vec{r}_D - \lambda\vec{r}_D = \vec{r}_A - \lambda\vec{r}_B$$



Koordinate djelišne točke – 1. pristup

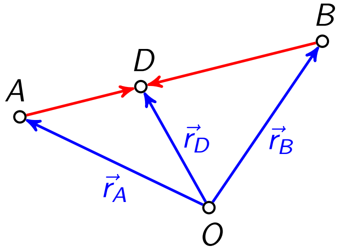
$$\overrightarrow{AD} = \lambda\overrightarrow{BD}$$

$$\vec{r}_D - \vec{r}_A = \lambda\big(\vec{r}_D - \vec{r}_B\big)$$

$$\vec{r}_D - \vec{r}_A = \lambda\vec{r}_D - \lambda\vec{r}_B$$

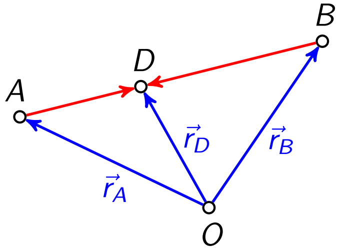
$$\vec{r}_D - \lambda\vec{r}_D = \vec{r}_A - \lambda\vec{r}_B$$

$$(1-\lambda)\vec{r}_D =$$



Koordinate djelišne točke – 1. pristup

$$\overrightarrow{AD} = \lambda \overrightarrow{BD}$$
$$\vec{r}_D - \vec{r}_A = \lambda\big(\vec{r}_D - \vec{r}_B\big)$$
$$\vec{r}_D - \vec{r}_A = \lambda\vec{r}_D - \lambda\vec{r}_B$$
$$\vec{r}_D - \lambda\vec{r}_D = \vec{r}_A - \lambda\vec{r}_B$$
$$(1-\lambda)\vec{r}_D = \vec{r}_A - \lambda\vec{r}_B$$



Koordinate djelišne točke – 1. pristup

$$\overrightarrow{AD} = \lambda\overrightarrow{BD}$$

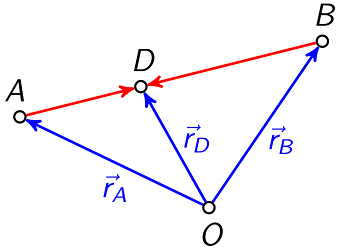
$$\vec{r}_D - \vec{r}_A = \lambda\big(\vec{r}_D - \vec{r}_B\big)$$

$$\vec{r}_D - \vec{r}_A = \lambda\vec{r}_D - \lambda\vec{r}_B$$

$$\vec{r}_D - \lambda\vec{r}_D = \vec{r}_A - \lambda\vec{r}_B$$

$$(1-\lambda)\vec{r}_D = \vec{r}_A - \lambda\vec{r}_B$$

$$\vec{r}_D =$$



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$$\overrightarrow{AD} = \lambda \overrightarrow{BD}$$

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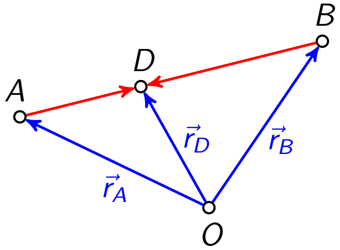
$$\vec{r}_D - \vec{r}_A = \lambda \vec{r}_D - \lambda \vec{r}_B$$

$$\vec{r}_D - \lambda \vec{r}_D = \vec{r}_A - \lambda \vec{r}_B$$

$$(1-\lambda)\vec{r}_D = \vec{r}_A - \lambda \vec{r}_B$$

$$\vec{r}_D = \underline{\qquad\qquad}$$



Koordinate djelišne točke – 1. pristup

$$\overrightarrow{AD} = \lambda\overrightarrow{BD}$$

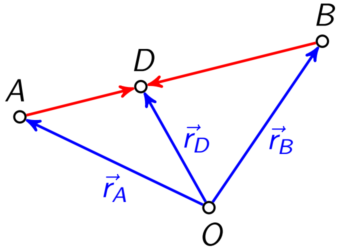
$$\vec{r}_D - \vec{r}_A = \lambda\big(\vec{r}_D - \vec{r}_B\big)$$

$$\vec{r}_D - \vec{r}_A = \lambda\vec{r}_D - \lambda\vec{r}_B$$

$$\vec{r}_D - \lambda\vec{r}_D = \vec{r}_A - \lambda\vec{r}_B$$

$$(1-\lambda)\vec{r}_D = \vec{r}_A - \lambda\vec{r}_B$$

$$\vec{r}_D = \frac{\vec{r}_A - \lambda\vec{r}_B}{}$$



Koordinate djelišne točke – 1. pristup

$$\overrightarrow{AD} = \lambda \overrightarrow{BD}$$

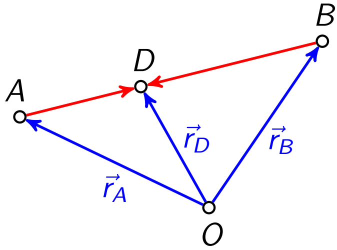
$$\vec{r}_D - \vec{r}_A = \lambda\big(\vec{r}_D - \vec{r}_B\big)$$

$$\vec{r}_D - \vec{r}_A = \lambda\vec{r}_D - \lambda\vec{r}_B$$

$$\vec{r}_D - \lambda\vec{r}_D = \vec{r}_A - \lambda\vec{r}_B$$

$$(1-\lambda)\vec{r}_D = \vec{r}_A - \lambda\vec{r}_B$$

$$\vec{r}_D = \frac{\vec{r}_A - \lambda\vec{r}_B}{1-\lambda}$$



Koordinate djelišne točke – 1. pristup

$$\overrightarrow{AD} = \lambda\overrightarrow{BD}$$

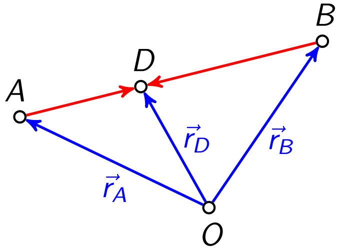
$$\vec{r}_D - \vec{r}_A = \lambda\left(\vec{r}_D - \vec{r}_B\right)$$

$$\vec{r}_D - \vec{r}_A = \lambda\vec{r}_D - \lambda\vec{r}_B$$

$$\vec{r}_D - \lambda\vec{r}_D = \vec{r}_A - \lambda\vec{r}_B$$

$$(1 - \lambda)\vec{r}_D = \vec{r}_A - \lambda\vec{r}_B$$

$$\boxed{\vec{r}_D = \frac{\vec{r}_A - \lambda\vec{r}_B}{1 - \lambda}}$$



Koordinate djelišne točke – 1. pristup

$$\overrightarrow{AD} = \lambda \overrightarrow{BD}$$

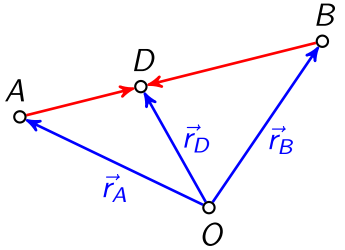
$$\vec{r}_D - \vec{r}_A = \lambda\big(\vec{r}_D - \vec{r}_B\big)$$

$$\vec{r}_D - \vec{r}_A = \lambda\vec{r}_D - \lambda\vec{r}_B$$

$$\vec{r}_D - \lambda\vec{r}_D = \vec{r}_A - \lambda\vec{r}_B$$

$$(1-\lambda)\vec{r}_D = \vec{r}_A - \lambda\vec{r}_B$$

$$\lambda \neq 1 \qquad \boxed{\vec{r}_D = \frac{\vec{r}_A - \lambda\vec{r}_B}{1-\lambda}}$$



Koordinate djelišne točke – 1. pristup

$$\overrightarrow{AD} = \lambda \overrightarrow{BD}$$

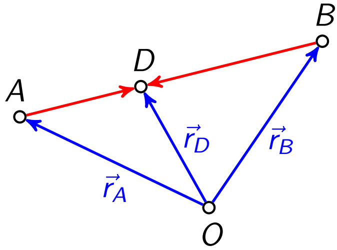
$$\vec{r}_D - \vec{r}_A = \lambda\big(\vec{r}_D - \vec{r}_B\big)$$

$$\vec{r}_D - \vec{r}_A = \lambda\vec{r}_D - \lambda\vec{r}_B$$

$$\vec{r}_D - \lambda\vec{r}_D = \vec{r}_A - \lambda\vec{r}_B$$

$$(1-\lambda)\vec{r}_D = \vec{r}_A - \lambda\vec{r}_B$$

$\lambda \neq 1$ $$\boxed{\vec{r}_D = \frac{\vec{r}_A - \lambda\vec{r}_B}{1-\lambda}}$$



$A(x_A, y_A, z_A)$

Koordinate djelišne točke – 1. pristup

$$\overrightarrow{AD} = \lambda \overrightarrow{BD}$$

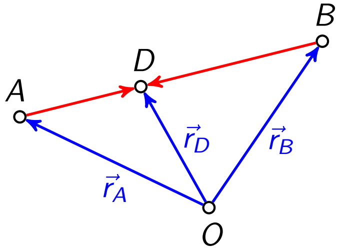
$$\vec{r}_D - \vec{r}_A = \lambda\big(\vec{r}_D - \vec{r}_B\big)$$

$$\vec{r}_D - \vec{r}_A = \lambda \vec{r}_D - \lambda \vec{r}_B$$

$$\vec{r}_D - \lambda \vec{r}_D = \vec{r}_A - \lambda \vec{r}_B$$

$$(1-\lambda)\vec{r}_D = \vec{r}_A - \lambda \vec{r}_B$$

$\lambda \neq 1$ $$\boxed{\vec{r}_D = \frac{\vec{r}_A - \lambda \vec{r}_B}{1-\lambda}}$$



$A(x_A, y_A, z_A)$ $B(x_B, y_B, z_B)$

Koordinate djelišne točke – 1. pristup

$$\overrightarrow{AD} = \lambda \overrightarrow{BD}$$

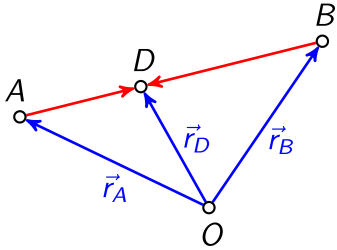
$$\vec{r}_D - \vec{r}_A = \lambda\big(\vec{r}_D - \vec{r}_B\big)$$

$$\vec{r}_D - \vec{r}_A = \lambda\vec{r}_D - \lambda\vec{r}_B$$

$$\vec{r}_D - \lambda\vec{r}_D = \vec{r}_A - \lambda\vec{r}_B$$

$$(1-\lambda)\vec{r}_D = \vec{r}_A - \lambda\vec{r}_B$$

$\lambda \neq 1$ $\boxed{\vec{r}_D = \dfrac{\vec{r}_A - \lambda\vec{r}_B}{1-\lambda}}$



$A(x_A, y_A, z_A)$ $B(x_B, y_B, z_B)$

$D\Big($

Koordinate djelišne točke – 1. pristup

$$\overrightarrow{AD} = \lambda \overrightarrow{BD}$$

$$\vec{r}_D - \vec{r}_A = \lambda\big(\vec{r}_D - \vec{r}_B\big)$$

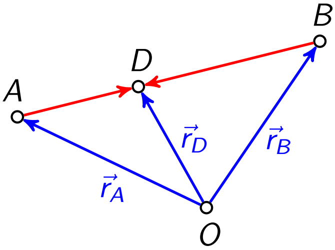
$$\vec{r}_D - \vec{r}_A = \lambda\vec{r}_D - \lambda\vec{r}_B$$

$$\vec{r}_D - \lambda\vec{r}_D = \vec{r}_A - \lambda\vec{r}_B$$

$$(1-\lambda)\vec{r}_D = \vec{r}_A - \lambda\vec{r}_B$$

$\lambda \neq 1$ $$\boxed{\vec{r}_D = \frac{\vec{r}_A - \lambda\vec{r}_B}{1-\lambda}}$$

$$D\left(\frac{x_A - \lambda x_B}{1-\lambda},\right.$$



$A(x_A, y_A, z_A)$ $B(x_B, y_B, z_B)$

Koordinate djelišne točke – 1. pristup

$$\overrightarrow{AD} = \lambda \overrightarrow{BD}$$

$$\vec{r}_D - \vec{r}_A = \lambda\big(\vec{r}_D - \vec{r}_B\big)$$

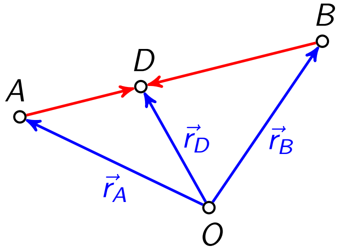
$$\vec{r}_D - \vec{r}_A = \lambda\vec{r}_D - \lambda\vec{r}_B$$

$$\vec{r}_D - \lambda\vec{r}_D = \vec{r}_A - \lambda\vec{r}_B$$

$$(1-\lambda)\vec{r}_D = \vec{r}_A - \lambda\vec{r}_B$$

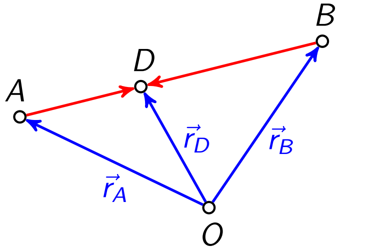
$\lambda \neq 1$ $\quad \boxed{\vec{r}_D = \dfrac{\vec{r}_A - \lambda\vec{r}_B}{1-\lambda}}$

$$D\left(\frac{x_A - \lambda x_B}{1-\lambda}, \frac{y_A - \lambda y_B}{1-\lambda}, \right.$$



$A(x_A, y_A, z_A) \qquad B(x_B, y_B, z_B)$

Koordinate djelišne točke – 1. pristup



$$\overrightarrow{AD} = \lambda \overrightarrow{BD}$$

$$\vec{r}_D - \vec{r}_A = \lambda\left(\vec{r}_D - \vec{r}_B\right)$$

$$\vec{r}_D - \vec{r}_A = \lambda\vec{r}_D - \lambda\vec{r}_B$$

$$\vec{r}_D - \lambda\vec{r}_D = \vec{r}_A - \lambda\vec{r}_B$$

$$(1-\lambda)\vec{r}_D = \vec{r}_A - \lambda\vec{r}_B$$

$A(x_A, y_A, z_A)$ $\quad$ $B(x_B, y_B, z_B)$

$\lambda \neq 1$

$$\boxed{\vec{r}_D = \frac{\vec{r}_A - \lambda\vec{r}_B}{1-\lambda}}$$

$$D\left(\frac{x_A - \lambda x_B}{1-\lambda}, \frac{y_A - \lambda y_B}{1-\lambda}, \frac{z_A - \lambda z_B}{1-\lambda}\right)$$

Koordinate djelišne točke – 1. pristup

$$\overrightarrow{AD} = \lambda \overrightarrow{BD}$$

$$\vec{r}_D - \vec{r}_A = \lambda\left(\vec{r}_D - \vec{r}_B\right)$$

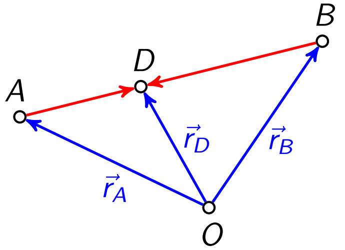
$$\vec{r}_D - \vec{r}_A = \lambda\vec{r}_D - \lambda\vec{r}_B$$

$$\vec{r}_D - \lambda\vec{r}_D = \vec{r}_A - \lambda\vec{r}_B$$

$$(1-\lambda)\vec{r}_D = \vec{r}_A - \lambda\vec{r}_B$$

$\lambda \neq 1$ $$\boxed{\vec{r}_D = \frac{\vec{r}_A - \lambda\vec{r}_B}{1-\lambda}}$$

$$D\left(\frac{x_A - \lambda x_B}{1-\lambda}, \frac{y_A - \lambda y_B}{1-\lambda}, \frac{z_A - \lambda z_B}{1-\lambda}\right)$$



$A(x_A, y_A, z_A)$ $B(x_B, y_B, z_B)$

polovište

Koordinate djelišne točke – 1. pristup

$$\overrightarrow{AD} = \lambda \overrightarrow{BD}$$

$$\vec{r}_D - \vec{r}_A = \lambda\big(\vec{r}_D - \vec{r}_B\big)$$

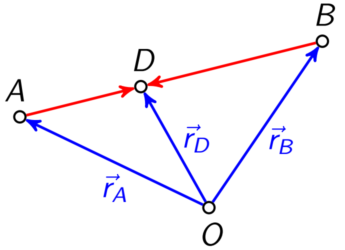
$$\vec{r}_D - \vec{r}_A = \lambda\vec{r}_D - \lambda\vec{r}_B$$

$$\vec{r}_D - \lambda\vec{r}_D = \vec{r}_A - \lambda\vec{r}_B$$

$$(1-\lambda)\vec{r}_D = \vec{r}_A - \lambda\vec{r}_B$$

$\lambda \neq 1$ $$\boxed{\vec{r}_D = \frac{\vec{r}_A - \lambda\vec{r}_B}{1-\lambda}}$$

$$D\left(\frac{x_A - \lambda x_B}{1-\lambda}, \frac{y_A - \lambda y_B}{1-\lambda}, \frac{z_A - \lambda z_B}{1-\lambda}\right)$$



$A(x_A, y_A, z_A)$ $B(x_B, y_B, z_B)$

polovište ⟶ $\lambda = -1$

Koordinate djelišne točke – 1. pristup

$$\overrightarrow{AD} = \lambda \overrightarrow{BD}$$

$$\vec{r}_D - \vec{r}_A = \lambda\left(\vec{r}_D - \vec{r}_B\right)$$

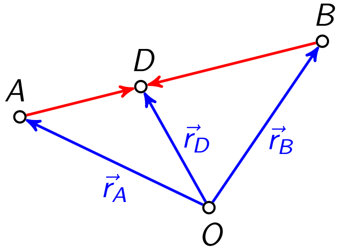
$$\vec{r}_D - \vec{r}_A = \lambda\vec{r}_D - \lambda\vec{r}_B$$

$$\vec{r}_D - \lambda\vec{r}_D = \vec{r}_A - \lambda\vec{r}_B$$

$$(1-\lambda)\vec{r}_D = \vec{r}_A - \lambda\vec{r}_B$$

$\lambda \neq 1$ $$\boxed{\vec{r}_D = \frac{\vec{r}_A - \lambda\vec{r}_B}{1-\lambda}}$$

$$D\left(\frac{x_A - \lambda x_B}{1-\lambda}, \frac{y_A - \lambda y_B}{1-\lambda}, \frac{z_A - \lambda z_B}{1-\lambda}\right)$$



$A(x_A, y_A, z_A)$ $B(x_B, y_B, z_B)$

polovište → $\lambda = -1$

$$P\left(\frac{x_A+x_B}{2}, \frac{y_A+y_B}{2}, \frac{z_A+z_B}{2}\right)$$

Koordinate djelišne točke – 1. pristup

$$\overrightarrow{AD} = \lambda \overrightarrow{BD}$$

$$\vec{r}_D - \vec{r}_A = \lambda(\vec{r}_D - \vec{r}_B)$$

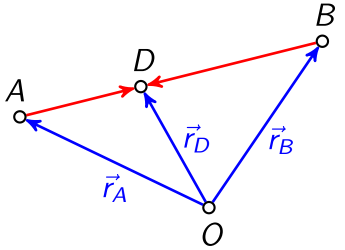
$$\vec{r}_D - \vec{r}_A = \lambda\vec{r}_D - \lambda\vec{r}_B$$

$$\vec{r}_D - \lambda\vec{r}_D = \vec{r}_A - \lambda\vec{r}_B$$

$$(1-\lambda)\vec{r}_D = \vec{r}_A - \lambda\vec{r}_B$$

$\lambda \neq 1$ $$\boxed{\vec{r}_D = \frac{\vec{r}_A - \lambda\vec{r}_B}{1-\lambda}}$$

$$D\left(\frac{x_A - \lambda x_B}{1-\lambda}, \frac{y_A - \lambda y_B}{1-\lambda}, \frac{z_A - \lambda z_B}{1-\lambda}\right)$$



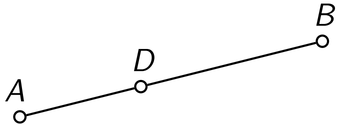
$A(x_A, y_A, z_A)$ $B(x_B, y_B, z_B)$

polovište ⟿ $\lambda = -1$

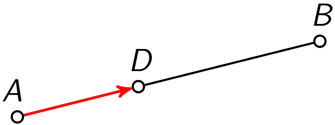
$$P\left(\frac{x_A+x_B}{2}, \frac{y_A+y_B}{2}, \frac{z_A+z_B}{2}\right)$$

Beskonačno daleku točku možemo *uhvatiti* s homogenim koordinatama.

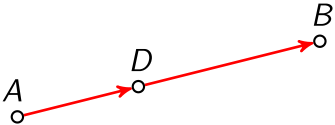
Koordinate djelišne točke – 2. pristup



Koordinate djelišne točke – 2. pristup

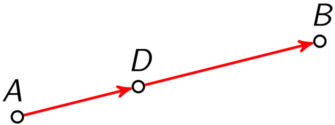


Koordinate djelišne točke – 2. pristup



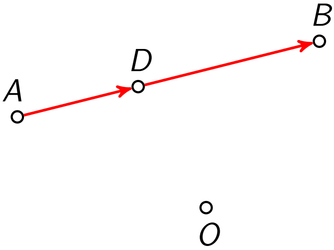
Koordinate djelišne točke – 2. pristup

$$\overrightarrow{AD} = \lambda \overrightarrow{DB}$$



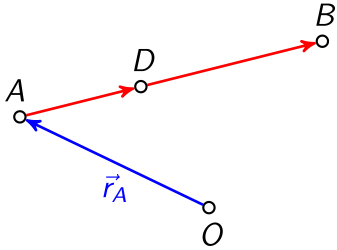
Koordinate djelišne točke – 2. pristup

$$\overrightarrow{AD} = \lambda \overrightarrow{DB}$$



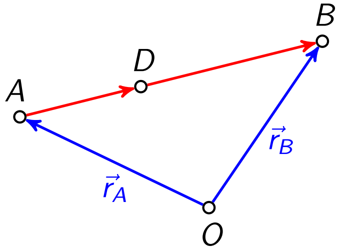
Koordinate djelišne točke – 2. pristup

$$\overrightarrow{AD} = \lambda \overrightarrow{DB}$$



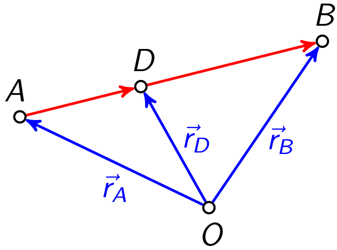
Koordinate djelišne točke – 2. pristup

$$\overrightarrow{AD} = \lambda \overrightarrow{DB}$$



Koordinate djelišne točke – 2. pristup

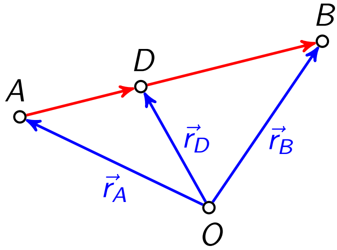
$$\overrightarrow{AD} = \lambda \overrightarrow{DB}$$



Koordinate djelišne točke – 2. pristup

$$\overrightarrow{AD} = \lambda \overrightarrow{DB}$$

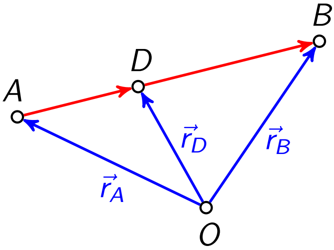
$$\vec{r}_D - \vec{r}_A =$$



Koordinate djelišne točke – 2. pristup

$$\overrightarrow{AD} = \lambda \overrightarrow{DB}$$

$$\vec{r}_D - \vec{r}_A = \lambda\big(\vec{r}_B - \vec{r}_D\big)$$

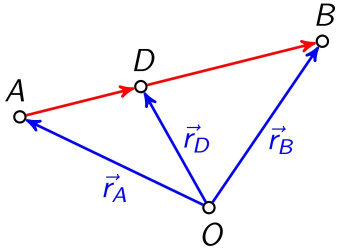


Koordinate djelišne točke – 2. pristup

$$\overrightarrow{AD} = \lambda\overrightarrow{DB}$$

$$\vec{r}_D - \vec{r}_A = \lambda\big(\vec{r}_B - \vec{r}_D\big)$$

$$\vec{r}_D - \vec{r}_A =$$

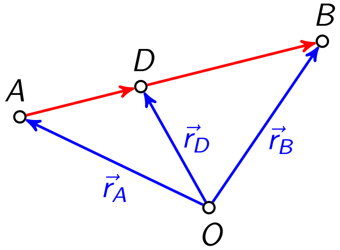


Koordinate djelišne točke – 2. pristup

$$\overrightarrow{AD} = \lambda\overrightarrow{DB}$$

$$\vec{r}_D - \vec{r}_A = \lambda\big(\vec{r}_B - \vec{r}_D\big)$$

$$\vec{r}_D - \vec{r}_A = \lambda\vec{r}_B - \lambda\vec{r}_D$$



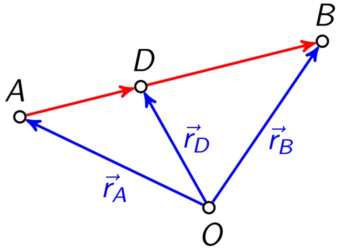
Koordinate djelišne točke – 2. pristup

$$\overrightarrow{AD} = \lambda\overrightarrow{DB}$$

$$\vec{r}_D - \vec{r}_A = \lambda\left(\vec{r}_B - \vec{r}_D\right)$$

$$\vec{r}_D - \vec{r}_A = \lambda\vec{r}_B - \lambda\vec{r}_D$$

$$\vec{r}_D + \lambda\vec{r}_D =$$



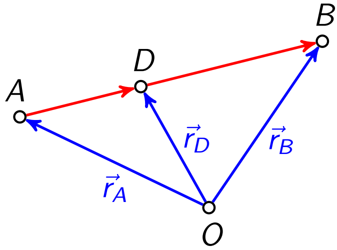
Koordinate djelišne točke – 2. pristup

$$\overrightarrow{AD} = \lambda \overrightarrow{DB}$$

$$\vec{r}_D - \vec{r}_A = \lambda\big(\vec{r}_B - \vec{r}_D\big)$$

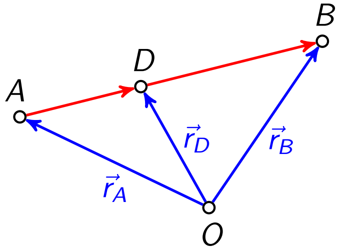
$$\vec{r}_D - \vec{r}_A = \lambda\vec{r}_B - \lambda\vec{r}_D$$

$$\vec{r}_D + \lambda\vec{r}_D = \vec{r}_A + \lambda\vec{r}_B$$



Koordinate djelišne točke – 2. pristup

$$\overrightarrow{AD} = \lambda\overrightarrow{DB}$$
$$\vec{r}_D - \vec{r}_A = \lambda\big(\vec{r}_B - \vec{r}_D\big)$$
$$\vec{r}_D - \vec{r}_A = \lambda\vec{r}_B - \lambda\vec{r}_D$$
$$\vec{r}_D + \lambda\vec{r}_D = \vec{r}_A + \lambda\vec{r}_B$$
$$(1+\lambda)\vec{r}_D =$$



Koordinate djelišne točke – 2. pristup

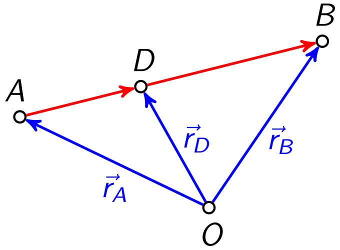
$$\overrightarrow{AD} = \lambda \overrightarrow{DB}$$

$$\vec{r}_D - \vec{r}_A = \lambda\left(\vec{r}_B - \vec{r}_D\right)$$

$$\vec{r}_D - \vec{r}_A = \lambda\vec{r}_B - \lambda\vec{r}_D$$

$$\vec{r}_D + \lambda\vec{r}_D = \vec{r}_A + \lambda\vec{r}_B$$

$$(1+\lambda)\vec{r}_D = \vec{r}_A + \lambda\vec{r}_B$$



Koordinate djelišne točke – 2. pristup

$$\overrightarrow{AD} = \lambda \overrightarrow{DB}$$

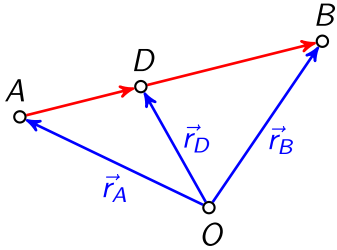
$$\vec{r}_D - \vec{r}_A = \lambda\big(\vec{r}_B - \vec{r}_D\big)$$

$$\vec{r}_D - \vec{r}_A = \lambda\vec{r}_B - \lambda\vec{r}_D$$

$$\vec{r}_D + \lambda\vec{r}_D = \vec{r}_A + \lambda\vec{r}_B$$

$$(1+\lambda)\vec{r}_D = \vec{r}_A + \lambda\vec{r}_B$$

$$\vec{r}_D =$$



Koordinate djelišne točke – 2. pristup

$$\overrightarrow{AD} = \lambda\overrightarrow{DB}$$

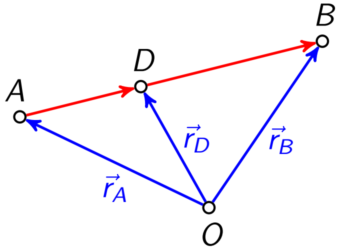
$$\vec{r}_D - \vec{r}_A = \lambda\left(\vec{r}_B - \vec{r}_D\right)$$

$$\vec{r}_D - \vec{r}_A = \lambda\vec{r}_B - \lambda\vec{r}_D$$

$$\vec{r}_D + \lambda\vec{r}_D = \vec{r}_A + \lambda\vec{r}_B$$

$$(1+\lambda)\vec{r}_D = \vec{r}_A + \lambda\vec{r}_B$$

$$\vec{r}_D = \underline{\qquad\qquad}$$



Koordinate djelišne točke – 2. pristup

$$\overrightarrow{AD} = \lambda\overrightarrow{DB}$$

$$\vec{r}_D - \vec{r}_A = \lambda\big(\vec{r}_B - \vec{r}_D\big)$$

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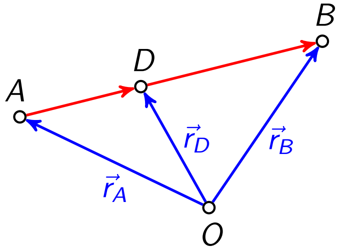
$$\vec{r}_D + \lambda\vec{r}_D = \vec{r}_A + \lambda\vec{r}_B$$

$$(1+\lambda)\vec{r}_D = \vec{r}_A + \lambda\vec{r}_B$$

$$\vec{r}_D = \frac{\vec{r}_A + \lambda\vec{r}_B}{}$$



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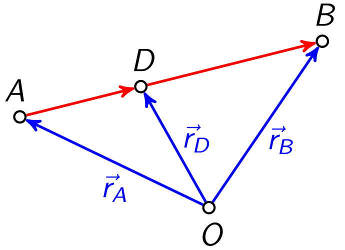
$$\vec{r}_D = \frac{\vec{r}_A + \lambda \vec{r}_B}{1+\lambda}$$



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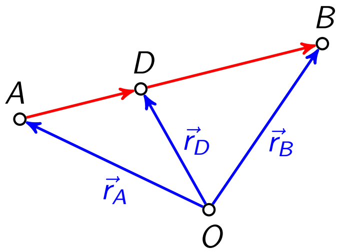

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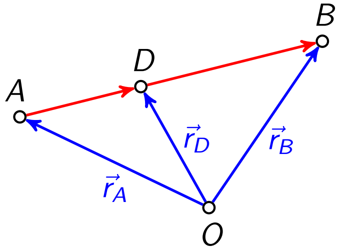
$\lambda \neq -1$ $$\boxed{\vec{r}_D = \frac{\vec{r}_A + \lambda \vec{r}_B}{1+\lambda}}$$



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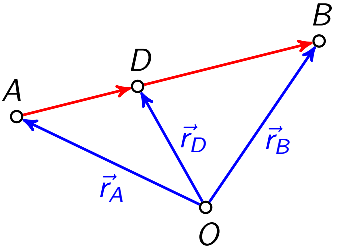

$A(x_A, y_A, z_A)$

Koordinate djelišne točke – 2. pristup

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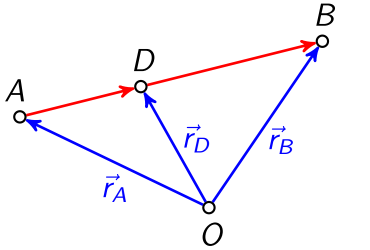

$A(x_A, y_A, z_A)$ $B(x_B, y_B, z_B)$

Koordinate djelišne točke – 2. pristup

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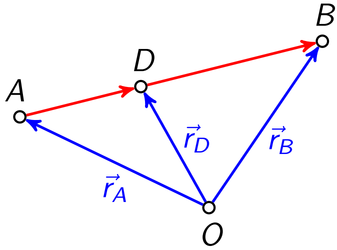
$D\Bigg($



$A(x_A, y_A, z_A)$ $B(x_B, y_B, z_B)$

Koordinate djelišne točke – 2. pristup

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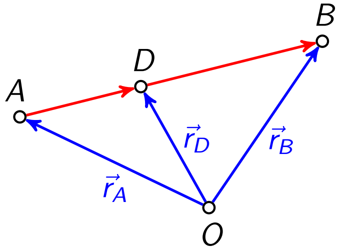
$$D\left(\frac{x_A + \lambda x_B}{1+\lambda},\right.$$



$A(x_A, y_A, z_A)$ $B(x_B, y_B, z_B)$

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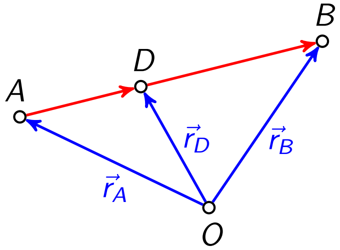
$$D\left(\frac{x_A + \lambda x_B}{1+\lambda}, \frac{y_A + \lambda y_B}{1+\lambda},\right.$$



$A(x_A, y_A, z_A)$ $B(x_B, y_B, z_B)$

Koordinate djelišne točke – 2. pristup

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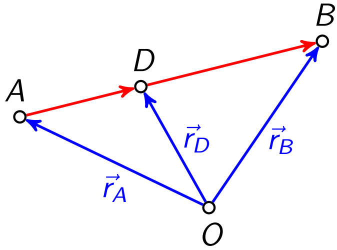
$$D\left(\frac{x_A + \lambda x_B}{1+\lambda}, \frac{y_A + \lambda y_B}{1+\lambda}, \frac{z_A + \lambda z_B}{1+\lambda}\right)$$



$A(x_A, y_A, z_A)$ $B(x_B, y_B, z_B)$

Koordinate djelišne točke – 2. pristup

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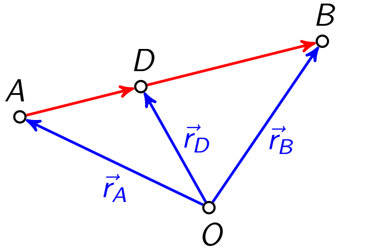
$$\boxed{\vec{r}_D = \frac{\vec{r}_A + \lambda \vec{r}_B}{1+\lambda}}$$

$$D\left(\frac{x_A + \lambda x_B}{1+\lambda}, \frac{y_A + \lambda y_B}{1+\lambda}, \frac{z_A + \lambda z_B}{1+\lambda}\right)$$



$A(x_A, y_A, z_A)$ $B(x_B, y_B, z_B)$

polovište

Koordinate djelišne točke – 2. pristup

$$\overrightarrow{AD} = \lambda \overrightarrow{DB}$$

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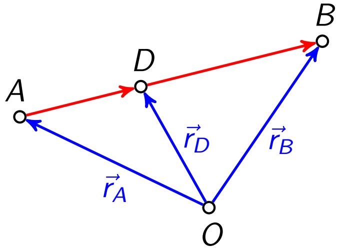
$$D\left(\frac{x_A + \lambda x_B}{1+\lambda}, \frac{y_A + \lambda y_B}{1+\lambda}, \frac{z_A + \lambda z_B}{1+\lambda}\right)$$



$A(x_A, y_A, z_A)$ $B(x_B, y_B, z_B)$

polovište → $\lambda = 1$

Koordinate djelišne točke – 2. pristup

$$\overrightarrow{AD} = \lambda \overrightarrow{DB}$$

$$\vec{r}_D - \vec{r}_A = \lambda\big(\vec{r}_B - \vec{r}_D\big)$$

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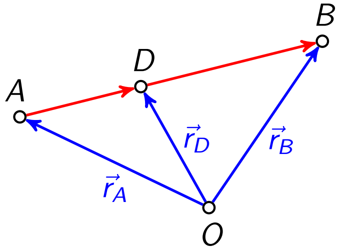
$\lambda \neq -1$ $\quad \boxed{\vec{r}_D = \dfrac{\vec{r}_A + \lambda \vec{r}_B}{1+\lambda}}$

$$D\left(\frac{x_A + \lambda x_B}{1+\lambda}, \frac{y_A + \lambda y_B}{1+\lambda}, \frac{z_A + \lambda z_B}{1+\lambda}\right)$$



$A(x_A, y_A, z_A) \qquad B(x_B, y_B, z_B)$

polovište ⇝ $\lambda = 1$

$$P\left(\frac{x_A+x_B}{2}, \frac{y_A+y_B}{2}, \frac{z_A+z_B}{2}\right)$$

Koordinate djelišne točke – 2. pristup

$$\overrightarrow{AD} = \lambda \overrightarrow{DB}$$

$$\vec{r}_D - \vec{r}_A = \lambda(\vec{r}_B - \vec{r}_D)$$

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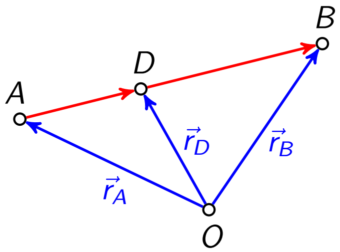


$A(x_A, y_A, z_A)$ $B(x_B, y_B, z_B)$

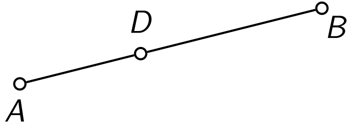
polovište ⟶ $\lambda = 1$

$$P\left(\frac{x_A+x_B}{2}, \frac{y_A+y_B}{2}, \frac{z_A+z_B}{2}\right)$$

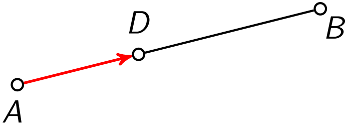
Beskonačno daleku točku možemo *uhvatiti* s homogenim koordinatama.

Parametrizacija dužine i pravca

Parametrizacija dužine i pravca



Parametrizacija dužine i pravca



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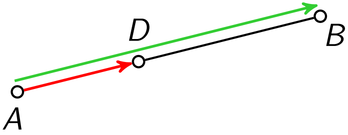
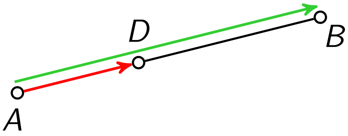


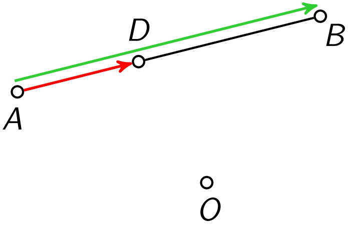
Parametrizacija dužine i pravca

$$\overrightarrow{AD} = \lambda \overrightarrow{AB}$$



Parametrizacija dužine i pravca

$$\overrightarrow{AD} = \lambda \overrightarrow{AB}$$



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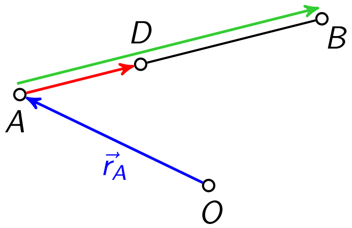

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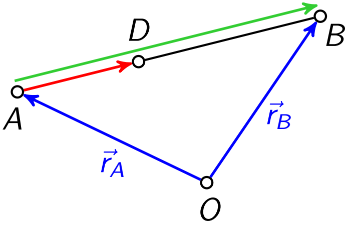
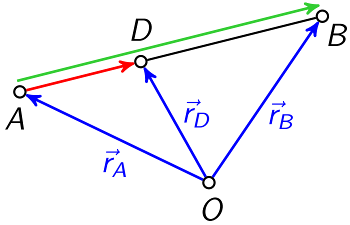


Parametrizacija dužine i pravca

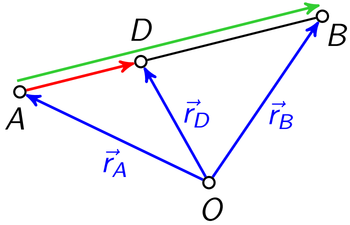
$$\overrightarrow{AD} = \lambda \overrightarrow{AB}$$



Parametrizacija dužine i pravca

$$\overrightarrow{AD} = \lambda \overrightarrow{AB}$$

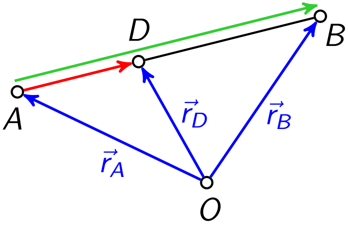
$$\vec{r}_D - \vec{r}_A =$$



Parametrizacija dužine i pravca

$$\overrightarrow{AD} = \lambda \overrightarrow{AB}$$

$$\vec{r}_D - \vec{r}_A = \lambda\left(\vec{r}_B - \vec{r}_A\right)$$



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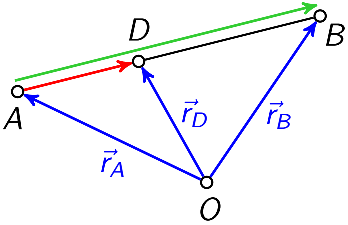

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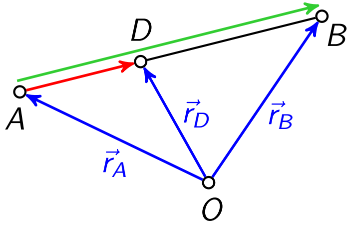

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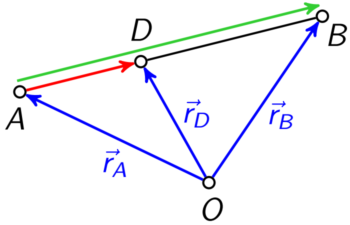
$$\vec{r}_D =$$



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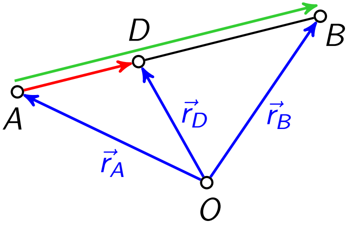
$$\vec{r}_D - \vec{r}_A = \lambda\big(\vec{r}_B - \vec{r}_A\big)$$

$$\vec{r}_D - \vec{r}_A = \lambda\vec{r}_B - \lambda\vec{r}_A$$

$$\vec{r}_D = \vec{r}_A + \lambda\vec{r}_B - \lambda\vec{r}_A$$



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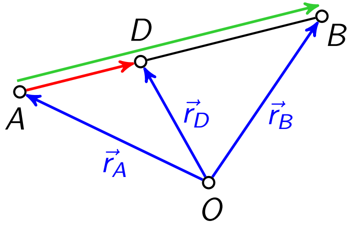

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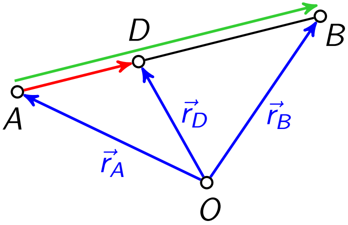
$$\vec{r}_D = \vec{r}_A + \lambda\vec{r}_B - \lambda\vec{r}_A$$

$$\vec{r}_D = (1-\lambda)\vec{r}_A$$



Parametrizacija dužine i pravca

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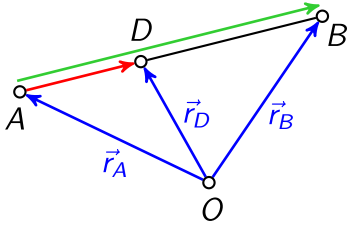
$$\vec{r}_D - \vec{r}_A = \lambda \vec{r}_B - \lambda \vec{r}_A$$

$$\vec{r}_D = \vec{r}_A + \lambda \vec{r}_B - \lambda \vec{r}_A$$

$$\vec{r}_D = (1-\lambda)\vec{r}_A + \lambda \vec{r}_B$$



Parametrizacija dužine i pravca

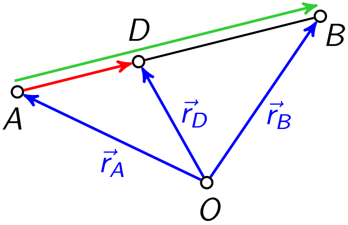
$$\overrightarrow{AD} = \lambda\overrightarrow{AB}$$

$$\vec{r}_D - \vec{r}_A = \lambda\big(\vec{r}_B - \vec{r}_A\big)$$

$$\vec{r}_D - \vec{r}_A = \lambda\vec{r}_B - \lambda\vec{r}_A$$

$$\vec{r}_D = \vec{r}_A + \lambda\vec{r}_B - \lambda\vec{r}_A$$

$$\boxed{\vec{r}_D = (1-\lambda)\vec{r}_A + \lambda\vec{r}_B}$$



Parametrizacija dužine i pravca

$$\overrightarrow{AD} = \lambda \overrightarrow{AB}$$

$$\vec{r}_D - \vec{r}_A = \lambda\left(\vec{r}_B - \vec{r}_A\right)$$

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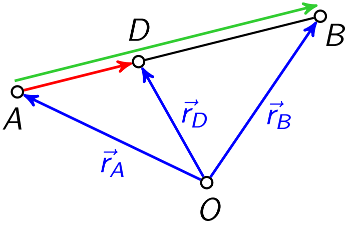

$A(x_A, y_A, z_A)$

Parametrizacija dužine i pravca

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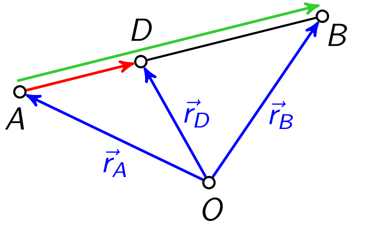
$$\vec{r}_D - \vec{r}_A = \lambda \vec{r}_B - \lambda \vec{r}_A$$

$$\vec{r}_D = \vec{r}_A + \lambda \vec{r}_B - \lambda \vec{r}_A$$

$$\boxed{\vec{r}_D = (1 - \lambda) \vec{r}_A + \lambda \vec{r}_B}$$



$A(x_A, y_A, z_A) \qquad B(x_B, y_B, z_B)$

Parametrizacija dužine i pravca

$$\overrightarrow{AD} = \lambda \overrightarrow{AB}$$

$$\vec{r}_D - \vec{r}_A = \lambda\left(\vec{r}_B - \vec{r}_A\right)$$

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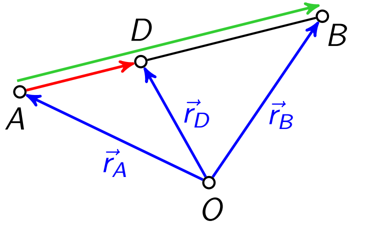

$A(x_A, y_A, z_A)$ $\qquad$ $B(x_B, y_B, z_B)$

$D\big($

Parametrizacija dužine i pravca

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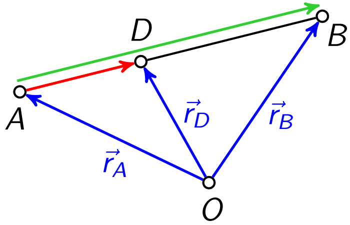

$A(x_A, y_A, z_A) \qquad B(x_B, y_B, z_B)$

$D\big((1-\lambda)x_A + \lambda x_B,$

Parametrizacija dužine i pravca

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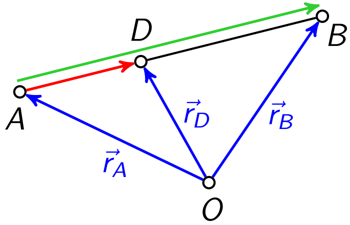

$A(x_A, y_A, z_A) \qquad B(x_B, y_B, z_B)$

$D\big((1-\lambda)x_A+\lambda x_B,\ (1-\lambda)y_A+\lambda y_B,$

Parametrizacija dužine i pravca

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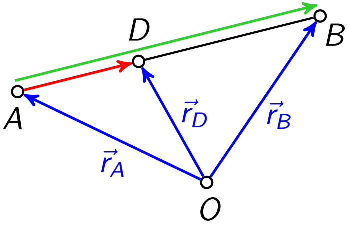

$A(x_A, y_A, z_A) \qquad B(x_B, y_B, z_B)$

$$D\big((1-\lambda)x_A+\lambda x_B,\ (1-\lambda)y_A+\lambda y_B,\ (1-\lambda)z_A+\lambda z_B\big)$$

Parametrizacija dužine i pravca

$$\overrightarrow{AD} = \lambda\overrightarrow{AB}$$

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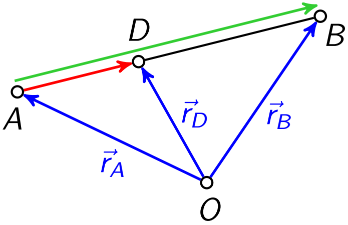

$A(x_A, y_A, z_A)$ $\quad$ $B(x_B, y_B, z_B)$

$$D\big((1-\lambda)x_A+\lambda x_B,\ (1-\lambda)y_A+\lambda y_B,\ (1-\lambda)z_A+\lambda z_B\big)$$

polovište

Parametrizacija dužine i pravca

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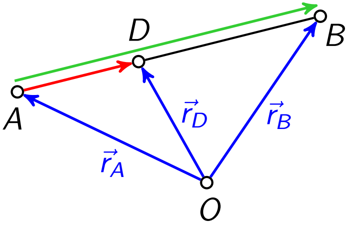
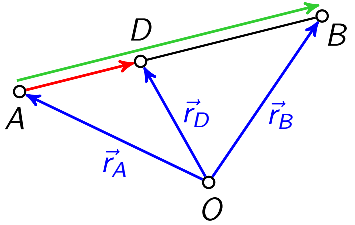


$A(x_A, y_A, z_A) \qquad B(x_B, y_B, z_B)$

$$D\big((1-\lambda)x_A+\lambda x_B,\ (1-\lambda)y_A+\lambda y_B,\ (1-\lambda)z_A+\lambda z_B\big)$$

polovište $\rightsquigarrow$ $\lambda = \frac{1}{2}$

Parametrizacija dužine i pravca



$$\overrightarrow{AD} = \lambda \overrightarrow{AB}$$

$$\vec{r}_D - \vec{r}_A = \lambda\left(\vec{r}_B - \vec{r}_A\right)$$

$$\vec{r}_D - \vec{r}_A = \lambda\vec{r}_B - \lambda\vec{r}_A$$

$$\vec{r}_D = \vec{r}_A + \lambda\vec{r}_B - \lambda\vec{r}_A$$

$$\boxed{\vec{r}_D = (1-\lambda)\vec{r}_A + \lambda\vec{r}_B}$$

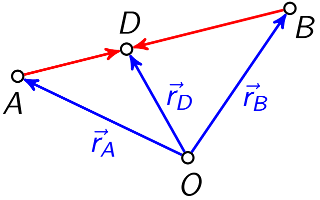
$A(x_A, y_A, z_A) \qquad B(x_B, y_B, z_B)$

$$D\big((1-\lambda)x_A+\lambda x_B,\ (1-\lambda)y_A+\lambda y_B,\ (1-\lambda)z_A+\lambda z_B\big)$$

polovište $\rightsquigarrow$ $\lambda = \frac{1}{2}$ $\qquad P\left(\frac{x_A+x_B}{2}, \frac{y_A+y_B}{2}, \frac{z_A+z_B}{2}\right)$

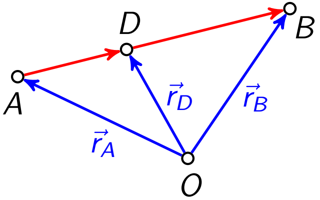
$$\vec{r}_D = \frac{\vec{r}_A - \lambda \vec{r}_B}{1-\lambda}$$

$$\vec{r}_D = \frac{1}{1-\lambda}\vec{r}_A + \frac{-\lambda}{1-\lambda}\vec{r}_B$$

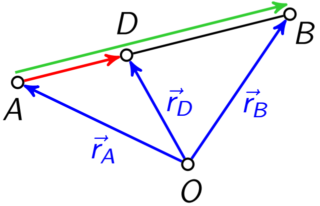


$$\vec{r}_D = \frac{\vec{r}_A + \lambda \vec{r}_B}{1+\lambda}$$

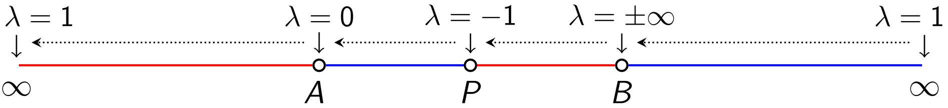
$$\vec{r}_D = \frac{1}{1+\lambda}\vec{r}_A + \frac{\lambda}{1+\lambda}\vec{r}_B$$



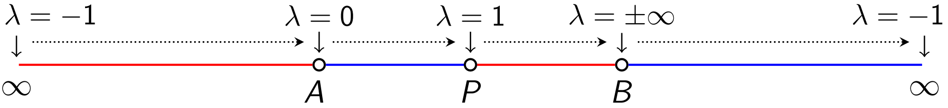
$$\vec{r}_D = (1-\lambda)\vec{r}_A + \lambda \vec{r}_B$$



$$\vec{r}_D = \frac{\vec{r}_A - \lambda \vec{r}_B}{1 - \lambda}$$



$$\vec{r}_D = \frac{\vec{r}_A + \lambda \vec{r}_B}{1 + \lambda}$$



$$\vec{r}_D = (1 - \lambda)\vec{r}_A + \lambda \vec{r}_B$$