

$$\textcircled{1.} \vec{a} = (4, -3, -2) \\ \vec{b} = (-7, 0, -3)$$

$$2\vec{a} = (8, -6, -4) \quad 2\vec{c} = \left(\frac{2}{5}, 0, \frac{38}{5}\right) \\ 3\vec{b} = (-21, 0, -9)$$

$$\vec{c} = -\vec{a} - \frac{2}{5}\vec{b} = -(4, -3, -2) - \frac{2}{5}(-7, 0, -3) = \\ = (-4, 3, 2) + \left(\frac{14}{5}, 0, \frac{6}{5}\right) = \left(\frac{1}{5}, 3, \frac{16}{5}\right) \checkmark$$

$$2\vec{a} \cdot 3\vec{b} = 8 \cdot (-21) + (-6) \cdot 0 + (-4) \cdot (-9) = -168 + 0 + 36 = -132 \checkmark$$

$$\vec{e}_b = \frac{\vec{b}}{|\vec{b}|} = \frac{(-7, 0, -3)}{\sqrt{(-7)^2 + 0^2 + (-3)^2}} = \frac{(-7, 0, -3)}{\sqrt{49+0+9}} = \frac{(-7, 0, -3)}{\sqrt{58}} = \left(\frac{-7}{\sqrt{58}}, 0, \frac{-3}{\sqrt{58}}\right) \checkmark$$

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$$\cos \varphi = \frac{\vec{a} \cdot 2\vec{c}}{|\vec{a}| |2\vec{c}|} = \frac{4 \cdot \frac{2}{5} + (-3) \cdot 0 + (-2) \cdot \frac{38}{5}}{\sqrt{4^2 + (-3)^2 + (-2)^2} \cdot \sqrt{\left(\frac{2}{5}\right)^2 + 0^2 + \left(\frac{38}{5}\right)^2}} = \frac{\frac{8}{5} + (-18) - \frac{76}{5}}{\sqrt{16+9+4} \sqrt{\frac{4}{25} + 36 + \frac{1444}{25}}} = \\ = \frac{\frac{8}{5} - \frac{90}{5} - \frac{76}{5}}{\sqrt{29} \sqrt{\frac{12348}{25}}} = \frac{-\frac{158}{5}}{\sqrt{68092}} = \frac{158}{\sqrt{68092}} = -0,605$$

$$\varphi = 127,26^\circ = 127^\circ 16' \checkmark$$

$$\textcircled{2.} \sqrt{x+5} = \sqrt{2x+17} - \sqrt{x}$$

Preizkus

$$\sqrt{x+5} + \sqrt{x} = \sqrt{2x+17} \quad \checkmark$$

$$\textcircled{1.} \sqrt{-9+5} \stackrel{?}{=} \sqrt{2 \cdot (-9)+17} - \sqrt{-9}$$

$$x+5 + 2\sqrt{x+5}\sqrt{x} + x = 2x+17$$

$$\sqrt{-4} \neq \sqrt{-1} - \sqrt{-9} \quad \checkmark$$

$$2\sqrt{x^2+5x} = 17-5 \quad \checkmark$$

$$\textcircled{2.} \sqrt{4+5} \stackrel{?}{=} \sqrt{2 \cdot 4+17} - \sqrt{4}$$

$$4x^2 + 20x = 144 \quad \checkmark$$

$$3 = 5 - 2$$

$$4x^2 + 20x - 144 = 0 \quad | :4$$

$$3 = 3 \quad \checkmark$$

$$x^2 + 5x - 36 = 0$$

$$(x+9)(x-4) = 0 \quad \checkmark$$

$$x_1 = -9 \quad \leadsto \text{ne ustreza rešitev}$$

$$x_2 = 4 \quad \leadsto \text{ustrezna rešitev} \quad \checkmark$$

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$$\textcircled{3.} \vec{a} = (x, 2, -1)$$

$$\vec{b} = (3, y, 2)$$

$$|\vec{a}| = 3$$

$$\vec{a} \perp \vec{b} \Leftrightarrow \vec{a} \cdot \vec{b} = 0$$

$$x = ? \quad y = ?$$

$$|\vec{a}| = \sqrt{a_1^2 + a_2^2 + a_3^2}$$

$$3 = \sqrt{x^2 + 2^2 + (-1)^2}$$

$$3 = \sqrt{x^2 + 4 + 1}$$

$$3 = \sqrt{x^2 + 5} \quad |^2$$

Preizkus

$$9 = x^2 + 5$$

$$x_1 = 2 \rightarrow \text{ustreza}$$

$$\textcircled{1.} 3 \stackrel{?}{=} \sqrt{2^2 + 2^2 + (-1)^2}$$

$$3 = \sqrt{9}$$

$$x^2 - 4 = 0$$

$$x_2 = -2 \rightarrow \text{ustreza}$$

$$3 = 3$$

$$(x+2)(x-2) = 0 \quad \checkmark$$

Projektor

$$\vec{a} \cdot \vec{b} = 0$$

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

$$a_1b_1 + a_2b_2 + a_3b_3 = 0$$

$$3 = \sqrt{9}$$

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

$$3 = 3$$

$$6 + 2y + (-2) = 0$$

$$2y + 4 = 0$$

$$2y = -4 \quad | :2$$

$$y = -2$$

$$1. \quad x_1 = 2, \quad y_1 = -2$$

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

$$2. \quad x_2 = -2, \quad y_2 = 4$$

$$-6 + 2y - 2 = 0$$

$$2y - 8 = 0$$

$$2y = 8 \quad | :2$$

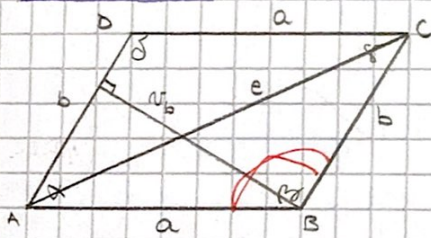
$$y = 4$$

$$\begin{aligned} 4. \quad & (9 + 4\sqrt{5})(2 - \sqrt{5})^2 + \sqrt{9^{\frac{3}{2}} - 2} - 0,25^{-0,5} + \frac{3\sqrt{10}}{4\sqrt{5} - 5\sqrt{2}} \\ & = (9 + 4\sqrt{5})(4 - 4\sqrt{5} + 5) + \sqrt{3^{\frac{3}{2}} - 2} - 4\sqrt{\frac{3\sqrt{10}(4\sqrt{5} + 5\sqrt{2})}{(4\sqrt{5} - 5\sqrt{2})(4\sqrt{5} + 5\sqrt{2})}} \\ & = 81 - 80 + \sqrt{3^3 - 2} - (2^2)^{\frac{1}{2}} + \frac{12\sqrt{50} + 15\sqrt{20}}{80 - 50} \\ & = 1 + 5 - 2 + \frac{60\sqrt{2} + 30\sqrt{5}}{30} \end{aligned}$$

$$= 4 + 2\sqrt{2} + \sqrt{5}$$

5. Paralelogram ABCD
 $a = 8 \text{ cm}$
 $b = 5 \text{ cm}$
 $\alpha = 48^\circ 14'$

→ nasprotna kuta sta enaka $\alpha = \gamma, \beta = \delta$
 → diagonala razpolavlja kuta



$\triangle ADC$

$$\frac{\alpha}{2} + \delta + \frac{\beta}{2} = 180^\circ$$

$$\delta = 180^\circ - 48^\circ 14'$$

$$\delta = 131^\circ 46' = 3$$

ne razpolavlja

$$\alpha + \beta = 180^\circ$$

$$e^2 = a^2 + b^2 - 2ab \cdot \cos \alpha$$

$$e^2 = 8^2 + 5^2 - 2 \cdot 8 \cdot 5 \cdot \cos 131^\circ 46'$$

$$e^2 = 64 + 25 - 80 \cos 131^\circ 46'$$

$$e = \sqrt{89 - 80 \cos 131^\circ 46'}$$

$$e = 11,9 \text{ cm}$$

$$\sin \alpha = \frac{e_b}{a}$$

$$e_b = a \cdot \sin \alpha$$

$$e_b = 8 \text{ cm} \cdot \sin 48^\circ 14'$$

$$e_b = 6,0 \text{ cm}$$

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6) $\triangle ABC$
 $A(3, -1, 2)$
 $B(-2, 4, 4)$
 $C(0, 0, -5)$

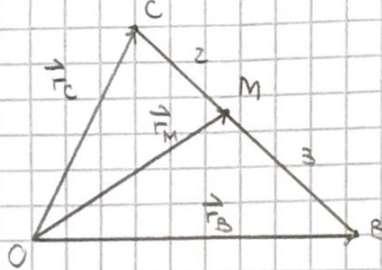
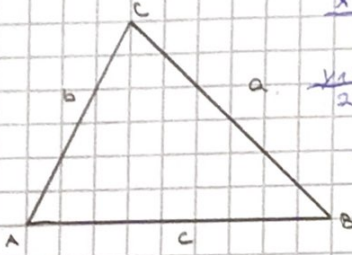
razpolovišče a
 $S\left(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2}, \frac{z_1+z_2}{2}\right)$

$$\frac{x_1+x_2}{2} = \frac{0+2}{2} = -1$$

$$S(-1, 2, -\frac{1}{2})$$

$$\frac{y_1+y_2}{2} = \frac{4+0}{2} = 2$$

$$\frac{z_1+z_2}{2} = \frac{4-5}{2} = -\frac{1}{2}$$



$$CM : MB = 2 : 3$$

$$\vec{r}_M = \frac{2}{5} \vec{r}_C + \frac{3}{5} \vec{r}_B$$

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

$$\vec{r}_M = (0, 0, -2) + (-\frac{6}{5}, \frac{12}{5}, \frac{12}{5})$$

$$\vec{r}_M = (-\frac{6}{5}, \frac{12}{5}, -\frac{7}{5})$$

$$M(-\frac{6}{5}, \frac{12}{5}, -\frac{7}{5})$$

7) $D_f = \mathbb{R}$

$Z_f = [-2, 0]$

↳ Funkcija je sodna, ker je zrcalna preko ordinatne osi.

↳ $f(-1) = -2$

↳ naraščanje: $x \in (-1, 0) \cup (1, \infty)$

↳ padanje: $x \in (-\infty, -1) \cup (0, 1)$

↳ funkcija je negativna po vsem definicijskem območju

~~↳ funkcija je naraščajoča pri 0~~
~~↳ funkcija je padajoča pri -2~~

↳ funkcija je navzgor omejena pri 0,
 navzdol pa pri -2

$M=0$
 $m=-2$

↳ lok. maks. $T_M(0, 0)$

↳ lok. min. $T_{m_1}(-1, -2); T_{m_2}(1, -2)$

↳ ničla $x_0 = 0$

↳ začetna vrednost $f(0) = 0$

(ker $x=0$)