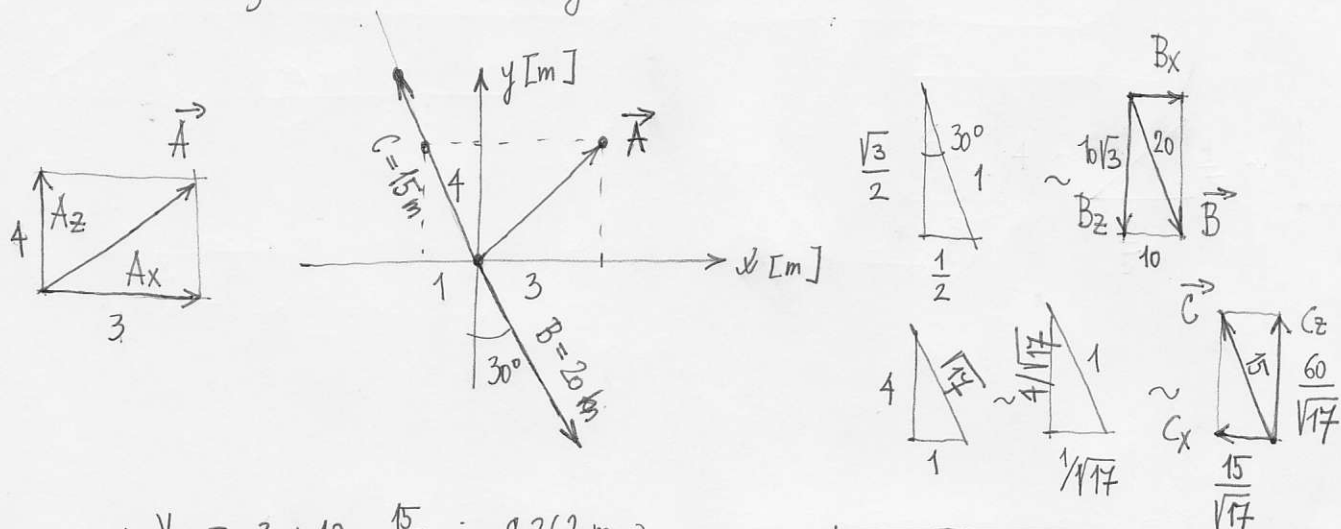


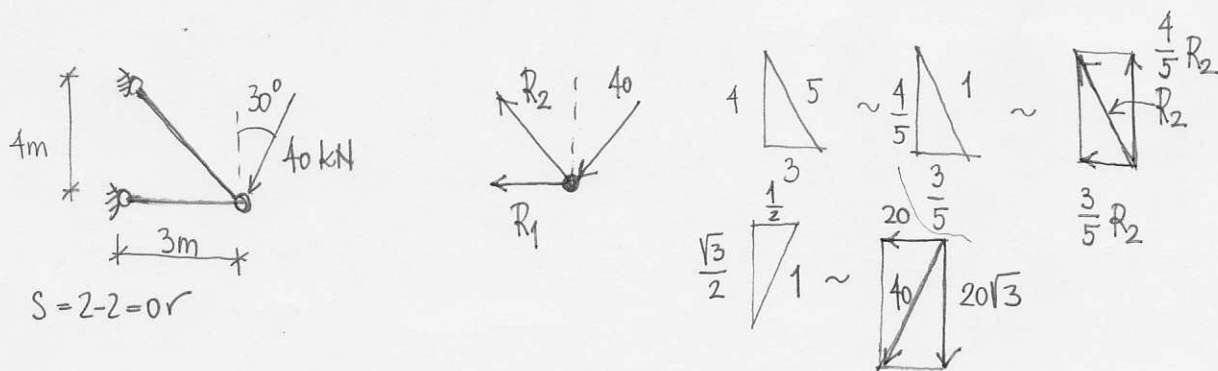
Pr.: 1 Určete výslednici dané soustavy vektorů



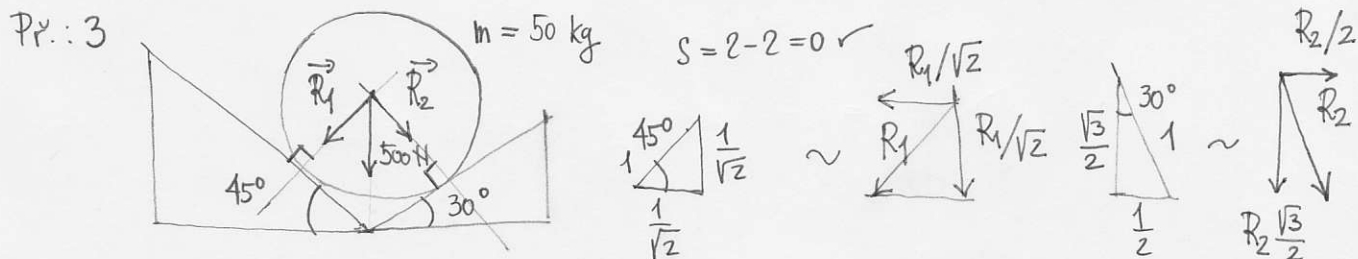
$$\begin{aligned} \rightarrow : V_x &= 3 + 10 - \frac{15}{\sqrt{17}} = 9,362 \text{ m} \\ \uparrow : V_y &= 4 - 10\sqrt{3} + \frac{60}{\sqrt{17}} = 1,232 \text{ m} \end{aligned} \Rightarrow \|\vec{V}\| = \sqrt{9,362^2 + 1,232^2} = 9,443 \text{ m}$$

Rozložte výslednici do směrů viz. strana 3.

Pr.: 2 Určete reakce ve všech vazbách



$$\begin{aligned} \rightarrow : -R_1 - \frac{3}{5} R_2 - 20 &= 0 \Rightarrow R_1 = -45,981 \text{ kN} \quad (2) \\ \uparrow : \frac{4}{5} R_2 - 20\sqrt{3} &= 0 \Rightarrow R_2 = 43,301 \text{ kN} \quad (1) \end{aligned}$$



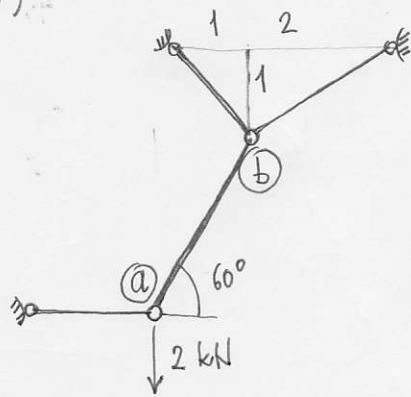
$$\rightarrow : -\frac{R_1}{\sqrt{2}} + R_2 \cdot \frac{1}{2} = 0 \quad (1)$$

$$\uparrow : -\frac{R_1}{\sqrt{2}} - R_2 \cdot \frac{\sqrt{3}}{2} - 500 = 0 \quad (2)$$

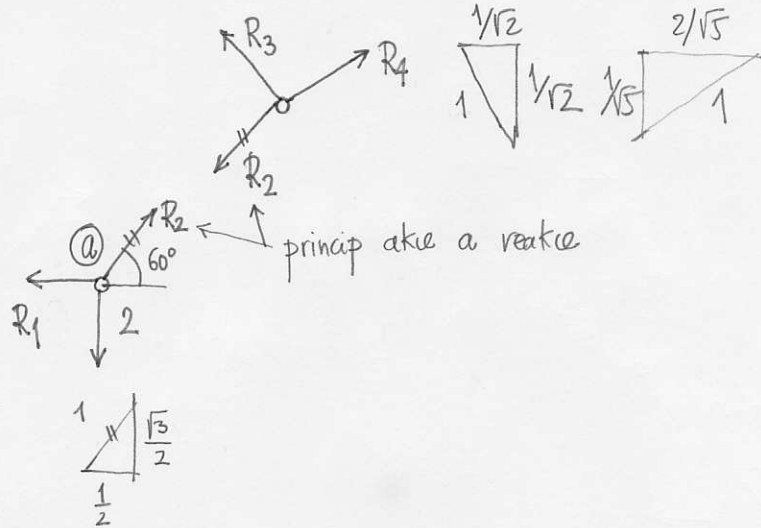
$$(2) - (1) : -\frac{R_2}{2} (\sqrt{3} + 1) = 500 \Rightarrow R_2 = -366,025 \text{ N}$$

$$(1) : R_1 = \frac{\sqrt{2}}{2} R_2 = -258,819 \text{ N}$$

Pr.: 4 Určete reakce ve všech vazbách
(volitelný)



$$S = 2 \cdot 2 - 4 = 0 \checkmark$$



$$\textcircled{a} : \rightarrow : -R_1 + R_2 \cdot \frac{1}{2} = 0 \Rightarrow R_1 = 1,555 \text{ kN} \quad (2)$$

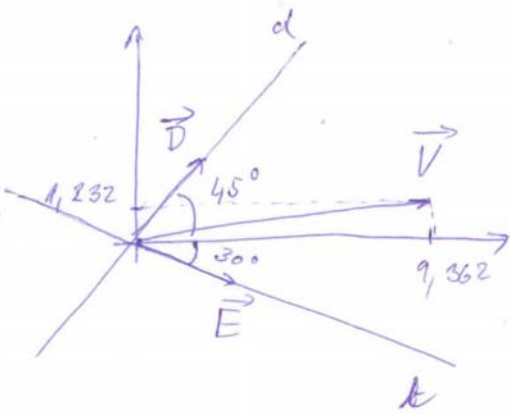
$$\uparrow : R_2 \cdot \frac{\sqrt{3}}{2} - 2 = 0 \Rightarrow R_2 = \frac{4}{\sqrt{3}} = 2,309 \text{ kN} \quad (1)$$

$$\textcircled{b} : \rightarrow : -\frac{R_2}{2} - \frac{R_3}{\sqrt{2}} + R_4 \cdot \frac{2}{\sqrt{5}} = 0 \quad (3)$$

$$\uparrow : -R_2 \cdot \frac{\sqrt{3}}{2} + \frac{R_3}{\sqrt{2}} + \frac{R_4}{\sqrt{5}} = 0 \quad (4)$$

$$(3) + (4) : \frac{3}{\sqrt{5}} R_4 = \frac{R_2}{2} (\sqrt{3} + 1) \Rightarrow R_4 = 2,351 \text{ kN}$$

$$(3) : R_3 = \sqrt{2} \left(-\frac{R_2}{2} + R_4 \cdot \frac{2}{\sqrt{5}} \right) = 1,341 \text{ kN}$$



$$V_x = D_x + E_x$$

$$V_y = D_y + E_y$$

$$9,362 = D \frac{\sqrt{2}}{2} + E \frac{\sqrt{3}}{2}$$

$$1,232 = D \frac{\sqrt{2}}{2} + E \frac{1}{2}$$

$$8,13 = 0 + E \cdot 0,366$$

$$\underline{\underline{5,95 = E}}$$

$$1,232 = 0,707D - 2,955$$

$$4,207 = 0,707D$$

$$\underline{\underline{5,95 = D}}$$

$$D \begin{array}{c} 45^\circ \\ \triangle \\ 5 \\ 5 \end{array} D_y = D \sin 45^\circ$$

$$D_x = D \cos 45^\circ$$

$$E \begin{array}{c} 30^\circ \\ \triangle \\ 1 \\ 2 \end{array} E_x = E \cos 30^\circ$$

$$E \begin{array}{c} 30^\circ \\ \triangle \\ 1 \\ 2 \end{array} E_y = E \sin 30^\circ$$

$$1 \cdot (-1) \cdot 1$$