

15 Obvodý a obsahy rovinných
obrazců

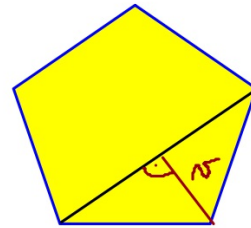
15.1. $\sigma = 62 \text{ cm}$
 $S = 301 \text{ cm}^2$
 $n = 54$
 $\alpha = 150^\circ$

15.2. $n = 5$
 $\sigma = 29,4 \text{ cm}$
 $S = 59 \text{ cm}^2$

15.3.

$$\sigma = 25 \text{ cm}$$

$$S = 42 \text{ cm}^2$$



15.4.

$$\sigma = 34 \text{ cm}$$

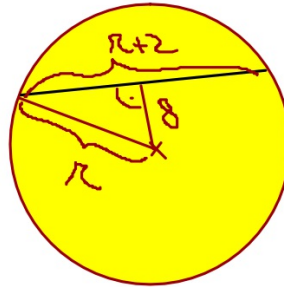
$$S = 60 \text{ cm}^2$$

15.5.

$$r = 10 \text{ cm}$$

$$\sigma = 62,3 \text{ cm}$$

$$S = 314 \text{ cm}^2$$

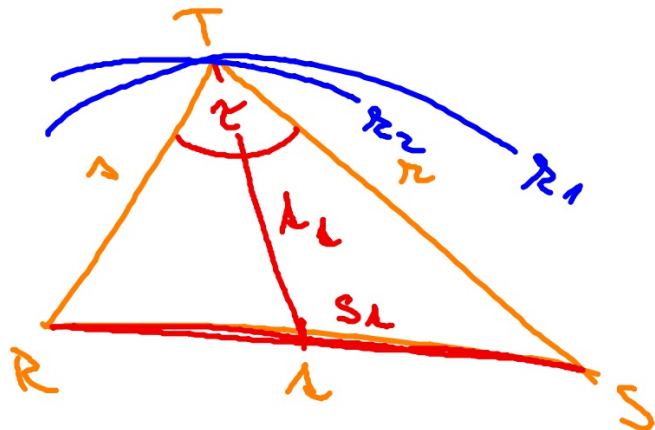


Konstantes Projektivitäts

16.3

ΔRST : $l = 7 \text{ cm}$
 $h_l = 5 \text{ cm}$
 $\alpha = |\angle STR| = 50^\circ$

1. Projektion



2. Posljednje konstrukcije

1. RS ; $|RS| = 7 \text{ cm}$

2. S_L ; S_L je sredina RS

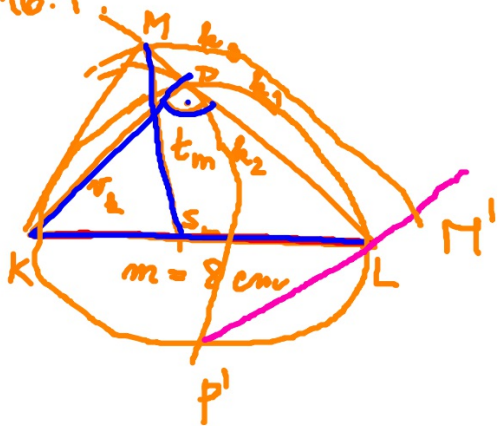
3. \mathcal{K}_1 ; $\mathcal{K}_1(S_L, 5 \text{ cm})$

4. \mathcal{K}_2 ; $\mathcal{K}_2 = \{X; |\angle SXR| = 50^\circ\}$

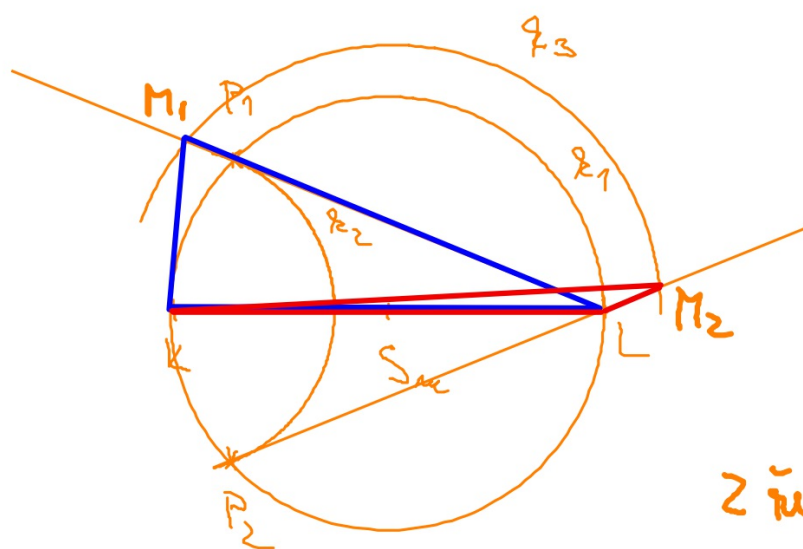
5. T ; $T \in \mathcal{K}_1 \cap \mathcal{K}_2$

6. $\triangle RST$

16.1.

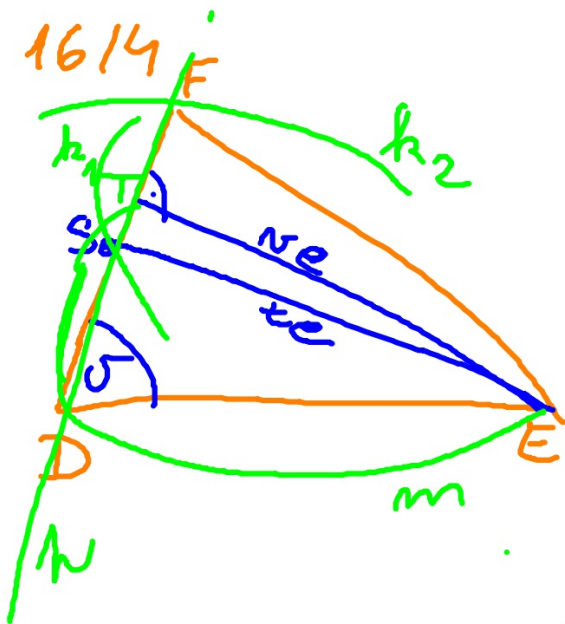


- 1) $KL; |KL| = 8 \text{ cm}$
- 2) $S_m; S_m$ je stred KL
- 3) $k_1; k_1(S_m; 4 \text{ cm})$
- 4) $k_2; k_2(K; 3 \text{ cm})$
- 5) $P; P \in k_1 \cap k_2$
- 6) $\leftrightarrow LP$
- 7) $k_3; k_3(S_m; 5 \text{ cm})$
- 8) $M; M \in k_3 \cap \leftrightarrow LP$
- 9) ΔKLM



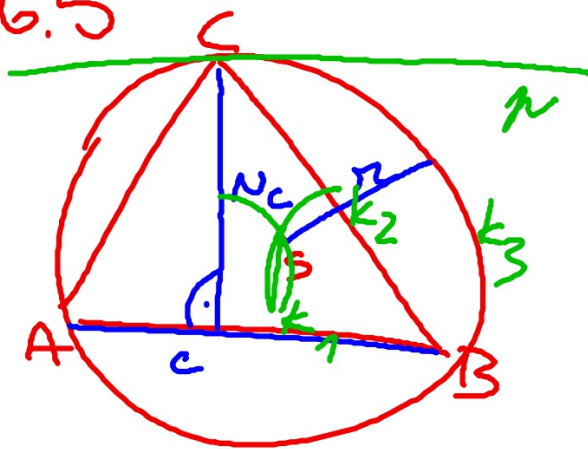
2 нѡм!

- 1) $V S_V ; |V S_V| = 4 \text{ cm}$
- 2) $k_1 ; \mathcal{Q}_1 (V; \mu = 7 \text{ cm})$
- 3) $k_2 ; \mathcal{Q}_2 (V; \nu = 5 \text{ cm})$
- 4) $\mathcal{Q}_2' ; S(S_V) : \mathcal{Q}_2 \rightarrow \mathcal{Q}_2'$
- 5) $T ; T \in \mathcal{Q}_1 \cap \mathcal{Q}_2'$
- 6) $U ; S(S_V) : T \rightarrow U$
- 7) ΔTUV

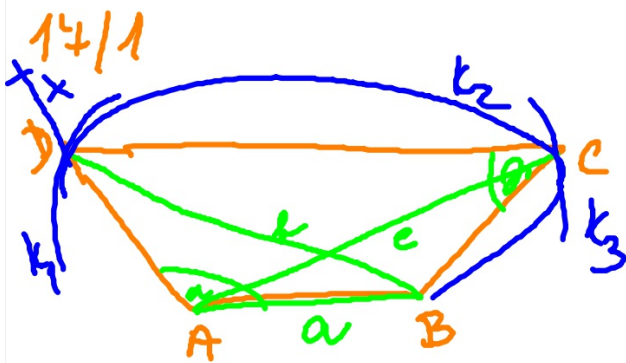


- 1) TE ; $|TE| = 4\text{cm}$
- 2) m ; $m = \sum x_i$ | $\angle TXE = 60^\circ$
- 3) n ; $n \perp TE \wedge TE \perp n$
- 4) D ; $D \in m \cap n$
- 5) h_1 ; $h_1(E, te)$
- 6) Se ; $Se \in h_1 \cap n$
- 7) h_2 ; $h_2(Se | SeD)$
- 8) F ; $F \in n \cap h_2$
- 9) $\triangle DEF$

16.5



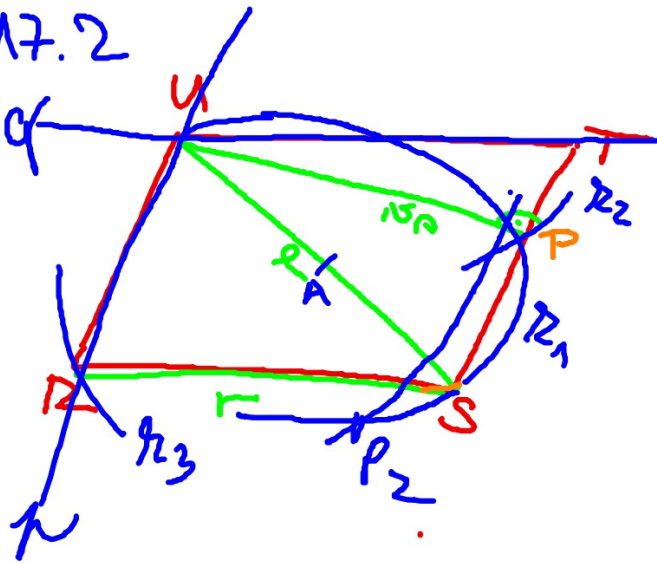
- 1) $AB \parallel AB, |AB| = 8 \text{ cm}$
- 2) $n, n \parallel AB \cap (AB, n) = n_c$
- 3) $k_1, k_1 (A, n_c)$
- 4) $k_2, k_2 (B, n_c)$
- 5) $S \in k_1 \cap k_2$
- 6) $k_3, k_3 (S, 5 \text{ cm})$
- 7) $C, C \in k_3 \cap n$
- 8) $\triangle ABC$



- 1) $AB; |AB| = C \text{ omv}$
- 2) $\mapsto AX; |\angle BAX| = 40^\circ$
- 3) $k_1; k_1 (Bit)$
- 4) $D; D \in k_1 \cap \mapsto AX$
- 5) $k_2; k_2 = \{Y; |\angle BYC| = 30^\circ\}$
- 6) $k_3; k_3 (Aie)$
- 7) $C; C \in k_3 \cap k_2$
- 8) $ABCD$

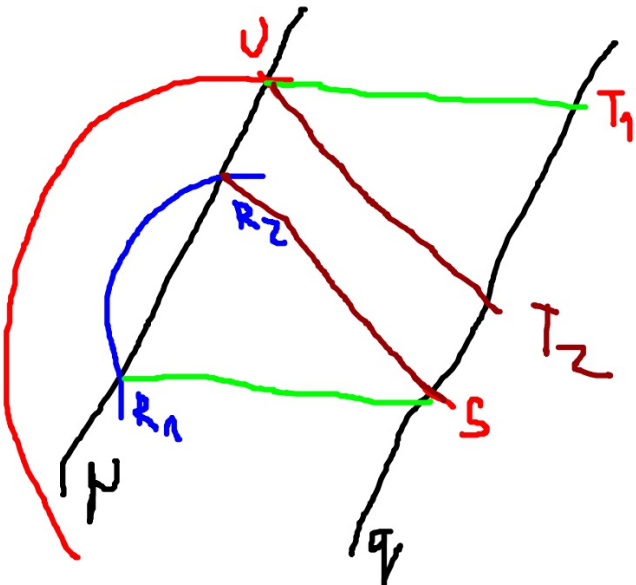
2. részem!

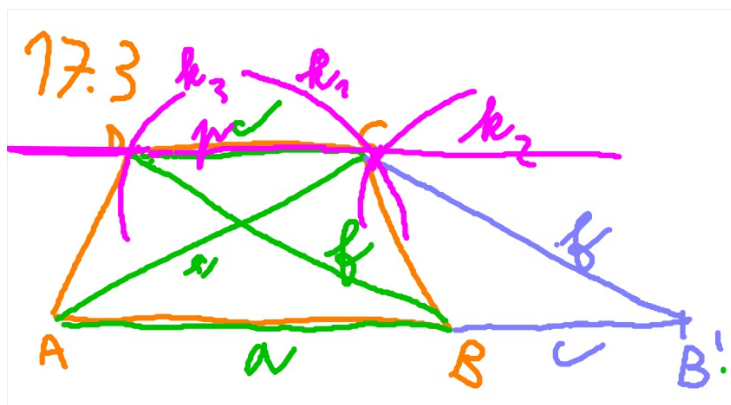
17.2



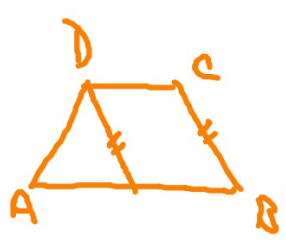
2 řešení!

1. US ; $|US| = 7\text{cm}$
2. A ; A je střed US
3. k_1 ; $k_1(A; 3,5\text{cm})$
4. k_2 ; $k_2(U; 10,5)$
5. P ; $P \in k_1 \cap k_2$
6. $\leftrightarrow SP$
7. n ; $n \parallel \leftrightarrow SP$; $U \in n$
8. k_3 ; $k_3(S; 6\text{cm})$
9. R ; $R \in k_3 \cap n$
10. q ; $q \parallel RS \wedge U \in q$
11. T ; $T \in q \cap \leftrightarrow SP$
12. $RSTU$



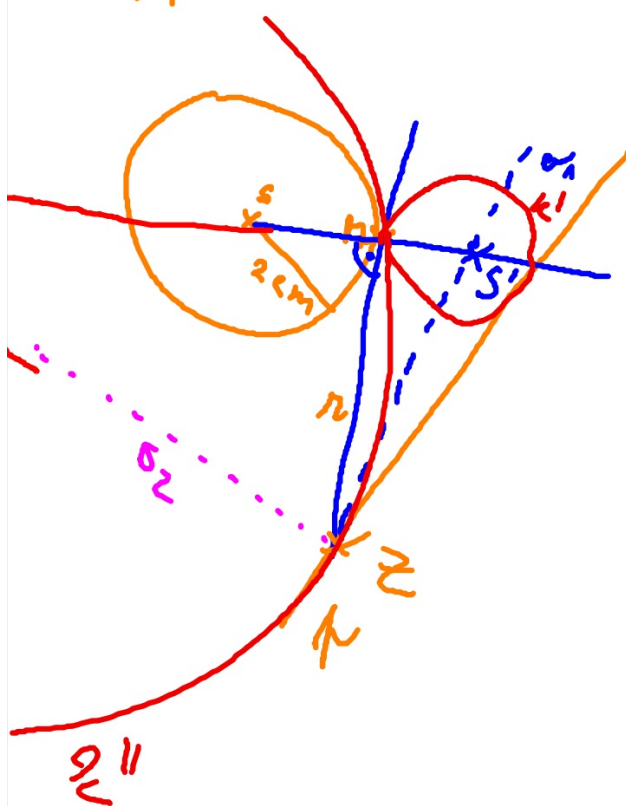


- 1) $AB'; |AB'| = 8 \text{ cm}$
- 2) $k_1; k_1(A; e)$
- 3) $k_2; k_2(B'; f)$
- 4) $C; C \in k_1 \cap k_2$
- 5) $p; p \parallel AB'; C \in p$
- 6) $B; B \in AB'; |AB| = 6 \text{ cm};$
- 7) $k_3; k_3(B; f)$
- 8) $D; D \in k_3 \cap p$
- 9) $\square ABCD$



1 răsare!

17/4



1. $k(S_2 \cap \sigma_1) \cap \rho \in k_1 \rho$
2. $k \leftrightarrow S M$
3. $\rho \perp \rho' \leftrightarrow S M \perp M \rho$
4. $z \perp z' \in \rho \cap \rho'$
5. σ_1, σ_2 isosa ρ ρ'
6. $S' \perp S' E \perp S M$
7. $k' \perp k' (S' \perp S' \rho')$

17.5 |



1) $k_1(S; 5\text{cm}) ; k_2(S; 3\text{cm}) ; P$

2) $k' ; k'(S; 4\text{cm})$

3) $P' ; P' \parallel P ; |PP'| = 1\text{cm}$

4) $S_1 ; S_1 \in k' \cap P'$

5) $l ; l(S_1; 1\text{cm})$

6) $P'' ; P'' \parallel P ; |PP''| = 4\text{cm}$

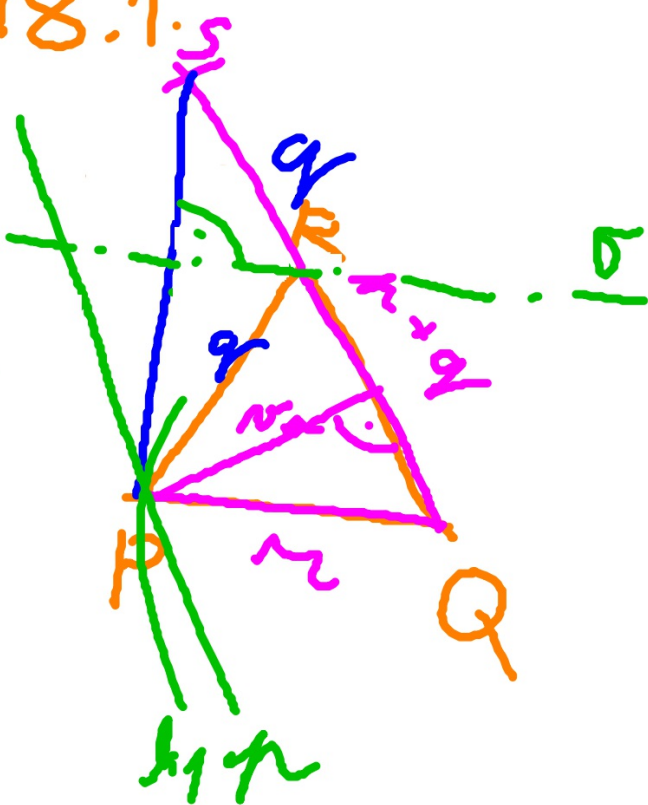
7) $k'' ; k''(S; 1\text{cm})$

8) $S_2 ; S_2 \in k'' \cap P''$

9) $l' ; l'(S_2; 4\text{cm})$

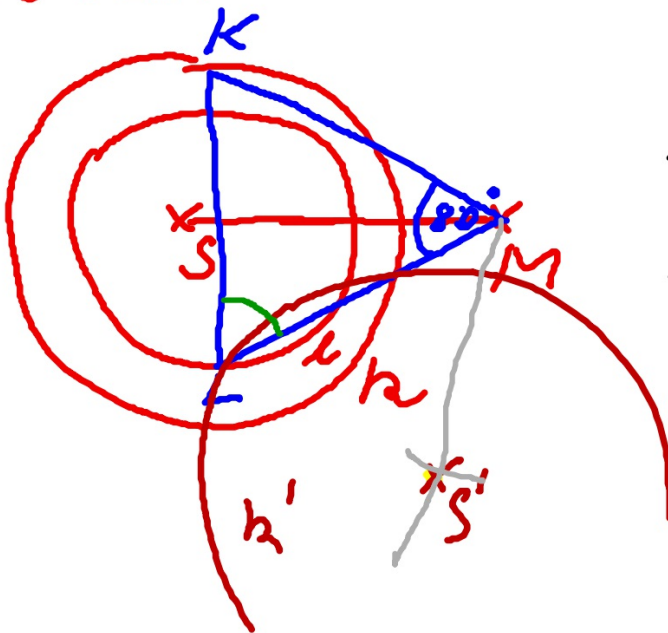
Shodna' zobrazeni'

18.1.



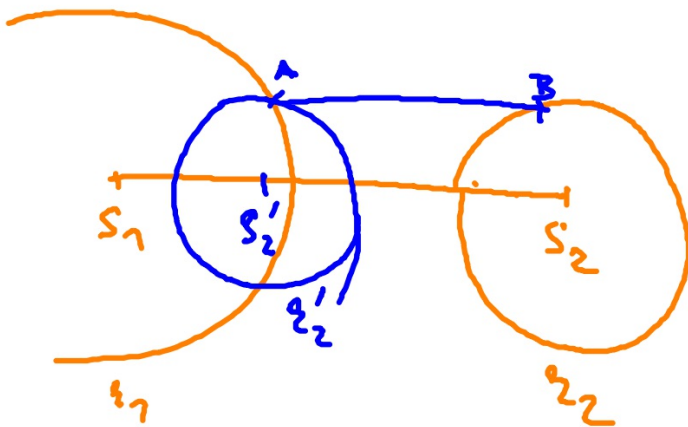
- 1) $SQ; |SQ| = 10\text{cm}$
- 2) $n; n \parallel SQ, d \perp SQ, d \cap SQ = M$
- 3) $l_1; l_1(Q, 7\text{cm})$
- 4) $P; P \in n \cap l_1$
- 5) $\sigma; \sigma$ je osa SP
- 6) $R; R \in \sigma \cap SQ$
- 7) $\triangle PQR$

18.3.



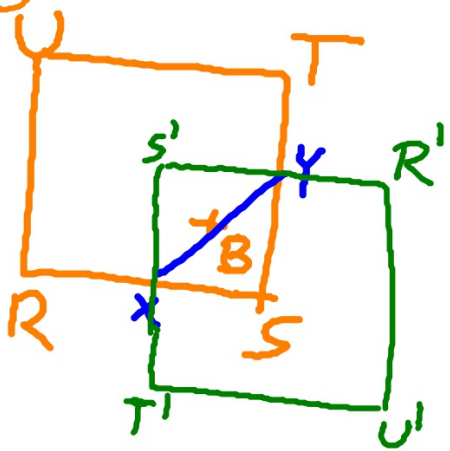
- 1, $k; k(S; 4\text{cm})$
- $l; l(S; 3\text{cm})$
- $M; |SM| = 6\text{cm}$
- 2) $k'; R(M; 80^\circ): k \rightarrow k'$
- 3, $L; L \in l \cap k'$
- 4, $K; R(M; -80^\circ): L \rightarrow k$
- 5, $\triangle KLM$

18.4

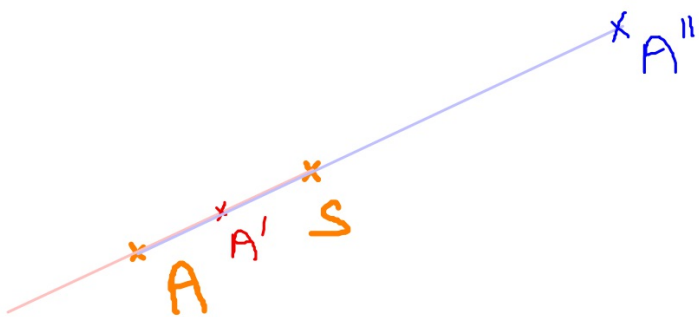


1. $S_1 S_2$; $|S_1 S_2| = 7 \text{ cm}$
2. l_1 ; $l_1(S_1; 4 \text{ cm})$
3. l_2 ; $l_2(S_2; 2 \text{ cm})$
4. l'_2 ; $T(\vec{n}; \vec{n} \parallel S_1 S_2$
 $|\vec{n}| = 3 \text{ cm})$:
 $l_2 \rightarrow l'_2$
5. A ; $A \in l_1 \cap l'_2$
6. B ; $T(-\vec{n})$: $A \rightarrow B$
7. AB

18.5



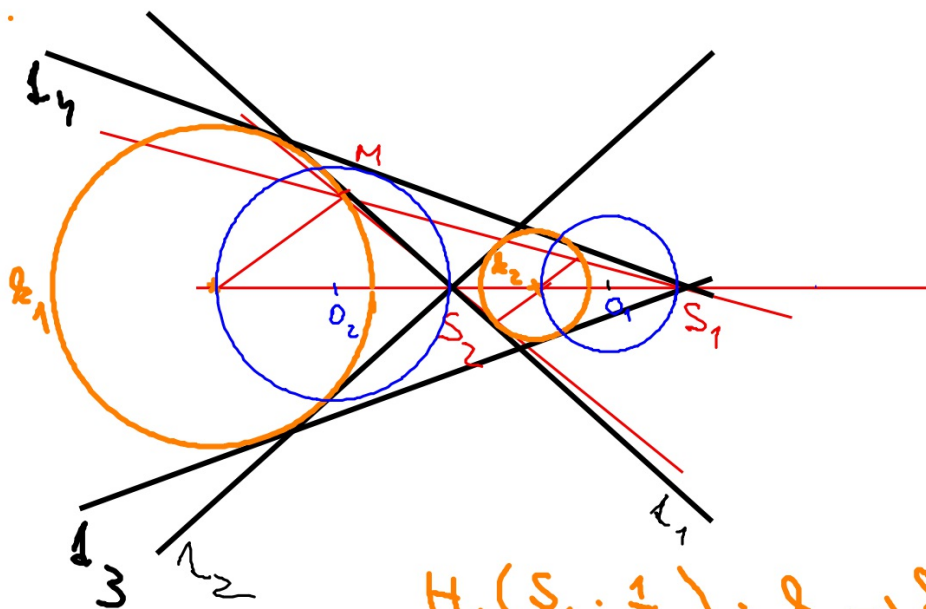
1. $\square RSTU; B$
2. $\square R'S'T'U'; S(B): RSTU \rightarrow R'S'U'$
3. $X, Y; X, Y \in RSTU \cap R'S'T'U'$
4. $\perp XY$



$$H(S; \frac{1}{2}) : A \rightarrow A'$$
$$H_1(S; -2) : A \rightarrow A''$$

Podobna' zobrazeni'

19.1.



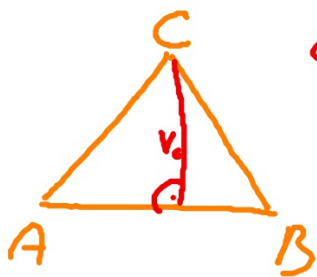
$$H_1(S_1; 3) : k_2 \rightarrow k_1$$

$$H_2(S_2; -3) : k_2 \rightarrow k_1$$

$$H_1(S_1; \frac{1}{3}) : k_1 \rightarrow k_2$$

$$H_2(S_2; -\frac{1}{3}) : k_1 \rightarrow k_2$$

19.2.

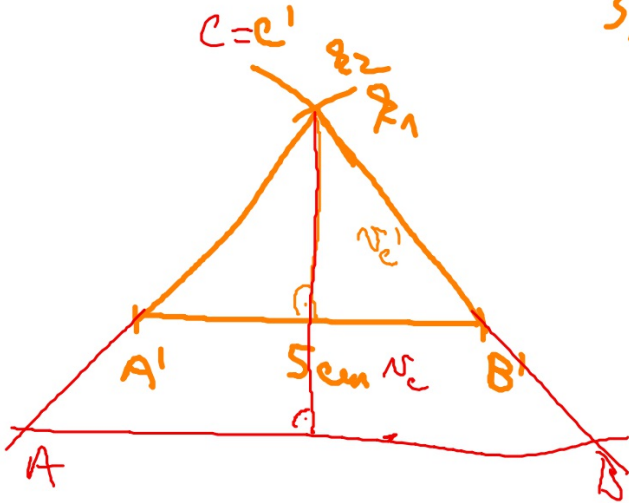


$$a:b:c = 2:4:5$$

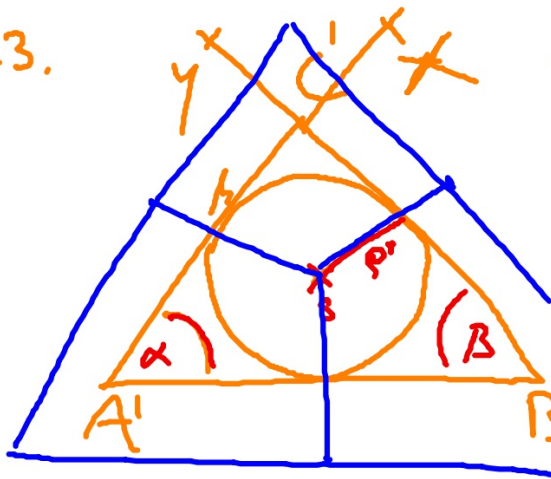
1) $\Delta A'B'C'$; $a' = 2\text{cm}$, $b' = 4\text{cm}$, $c' = 5\text{cm}$

2) $v_{c'}$

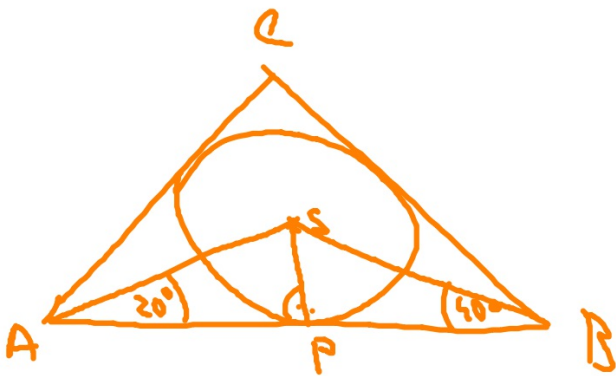
3) ΔABC ; $H(C'; \frac{v_c}{v_{c'}}): \Delta A'B'C' \rightarrow \Delta ABC$



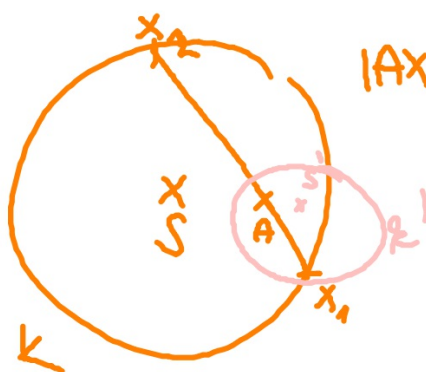
10.3.



- 1) $\Delta A'B'C'; |A'B'| = 8 \text{ cm}$
- 2) $\rightarrow AX; |X \times A'B'| = 40^\circ$
- 3) $\rightarrow B'Y; |X \times Y \times A'| = 60^\circ$
- 4) $C'; C'C \rightarrow AX \cap Y \rightarrow B'Y$
- 5) h je výšnice vepsané $\Delta A'B'C'$
- 6) $\Delta ABC; H(S; \frac{P}{S})$
 $\Delta A'B'C' \rightarrow \Delta ABC$



19.4.

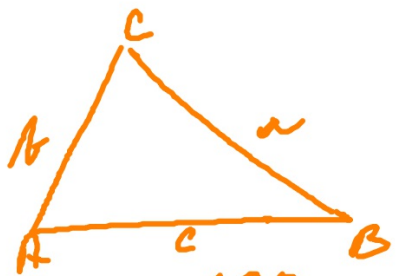


$$|Ax_1| = \frac{1}{3} |Ax_2|$$

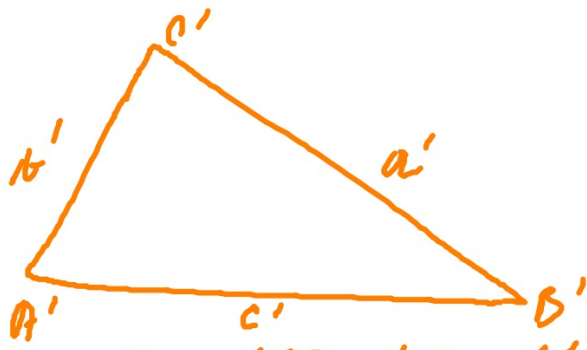
$$H(A, \frac{1}{3}) : x_2 \rightarrow x_1$$

1. $K; K(S; 5\text{cm})$
2. $A; |SA| = 3\text{cm}$
3. $K'; H(A; \frac{1}{3}) : K \rightarrow K'$
4. $x_1; x_1 \in K \cap K'$
5. $x_2; H(A; \frac{1}{3}) : x_1 \rightarrow x_2$
6. $x_1 x_2$

19.5.



$$o_1 = 100 \text{ cm}$$



$$o_2 = 100 + 40 = 140 \text{ cm}$$

$$k_2 = \frac{o_2}{o_1} = 1,4$$

$$a' = a + 8 = 1,4a$$

$$\Rightarrow a = 20 \text{ cm}$$

$$S = \sqrt{s \cdot (s-a) \cdot (s-b) \cdot (s-c)}$$

$$b' = b + 14 = 1,4b$$

$$\Rightarrow b = 35 \text{ cm}$$

$$s = \frac{o}{2}$$

$$c' = c + 18 = 1,4c$$

$$\Rightarrow c = 45 \text{ cm}$$

$$\underline{\underline{S_1 = 335,4 \text{ cm}^2}}$$

$$\underline{\underline{S_2 = 657,4 \text{ cm}^2}}$$