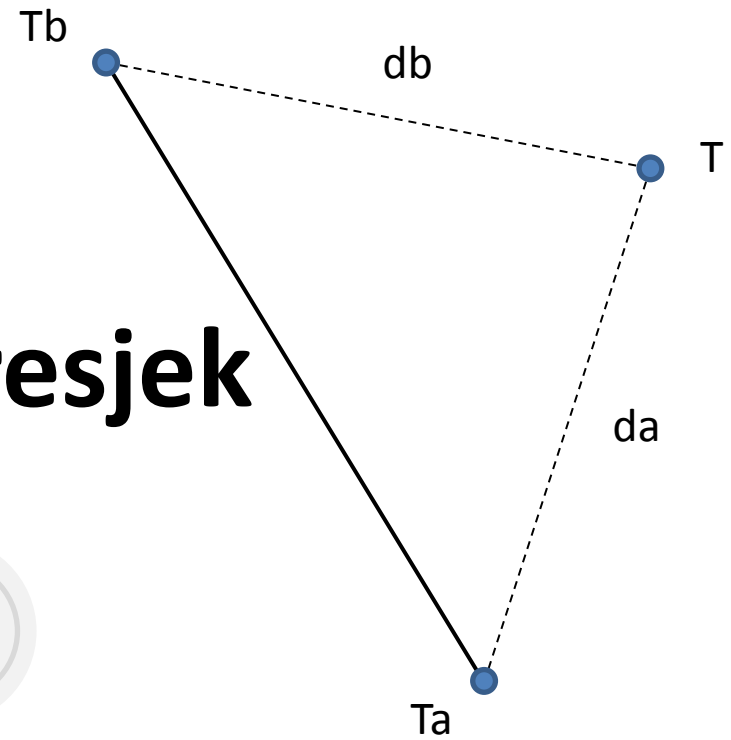


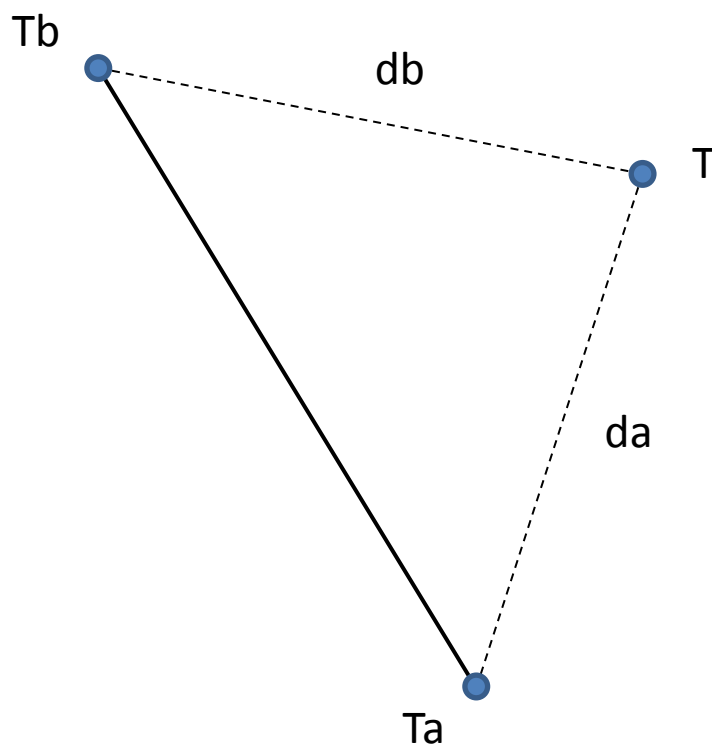
# Luční presjek

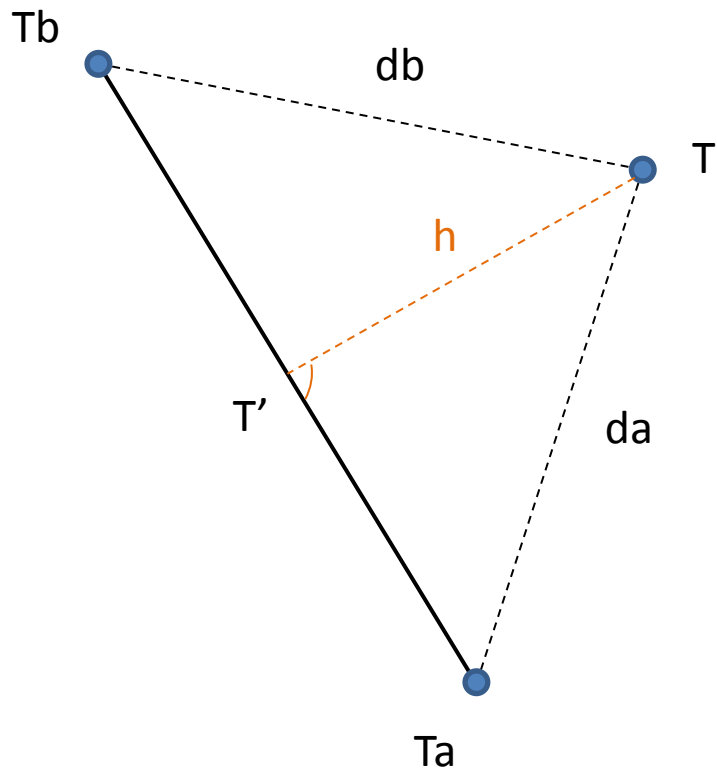


Armando Slaviček

Zadane su koordinate točaka **Ta** i **Tb**.

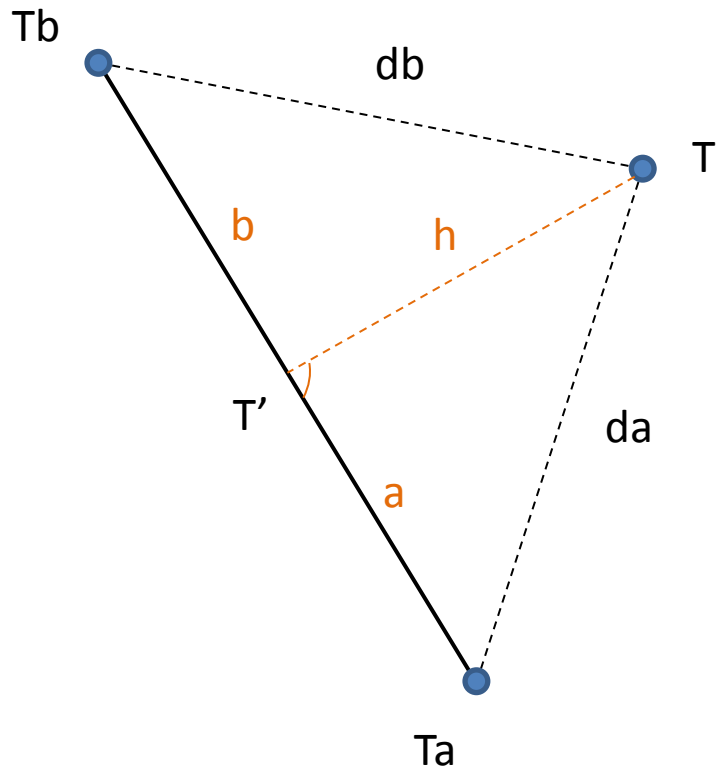
Odredi koordinate točke **T** ako su od točaka Ta i Tb izvršena odmjeranja dužina **da** i **db** do točke T.





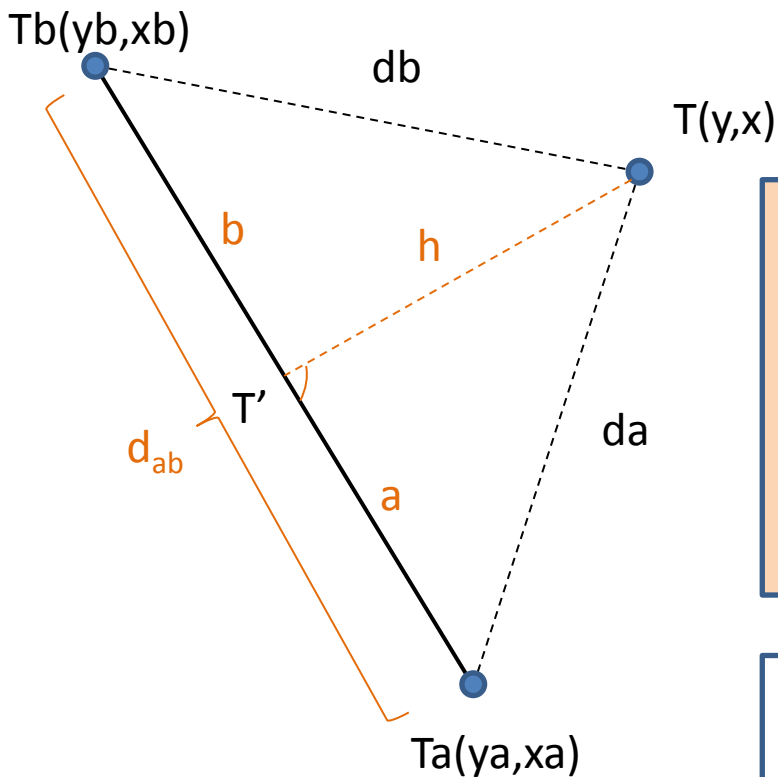
Iz točke T spustimo okomicu na dužinu  $\overline{TaTb}$  (visina trokuta -  $h$ ) i dobit ćemo točku  $T'$  u kojoj se sijeku okomica i dužina  $\overline{TaTb}$  (nožište visine).





Dužinu od točke Ta do T' označiti ćemo s **a**,  
a dužinu od točke T' do Tb označiti ćemo s **b**.

Koordinate točke T izračunati ćemo pomoću  
veličina **a** i **b**, te veličine **h**.



Iz skice vidimo da je  $a+b = d_{ab}$

Iz koordinata točaka  $T_a$  i  $T_b$  izračunati ćemo dužinu  $d_{ab}$ .

$$a + b = d_{ab} = \sqrt{(yb - ya)^2 + (xb - xa)^2} \quad / \frac{1}{2}$$

$$\frac{a + b}{2} = \frac{1}{2} \sqrt{(yb - ya)^2 + (xb - xa)^2} \quad \text{①}$$

Primjer:

<b>ya</b>	1258,64	<b>xa</b>	1568,35
<b>yb</b>	921,52	<b>xb</b>	1763,67
<b>yb-ya</b>	-337,12	<b>xb-xa</b>	195,32
<b>d=</b>	389,6149		
<b>(a+b)/2=</b>	194,8075		

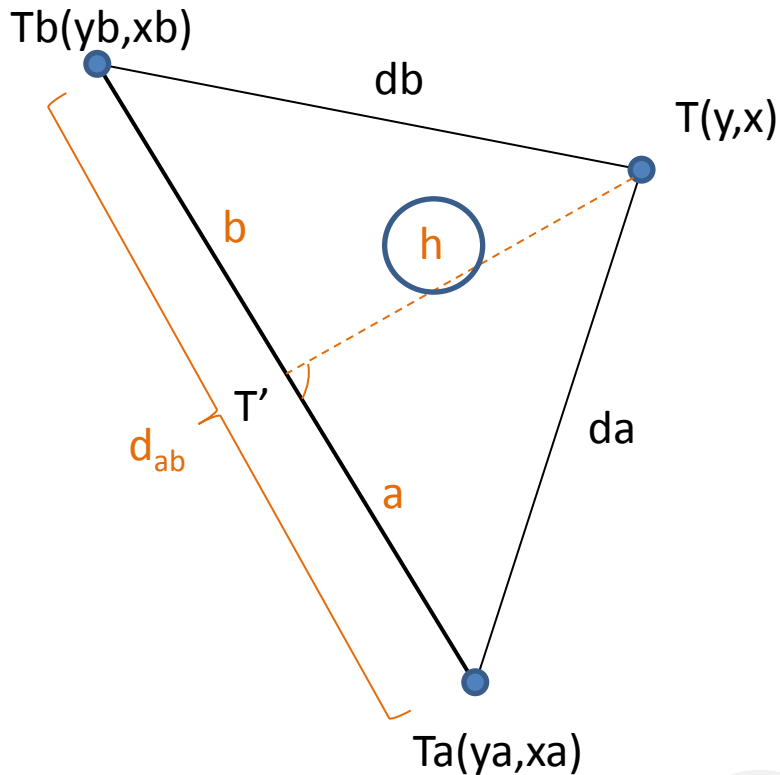


Iz trokuta TaT'T visina  $h$  iznosi:

$$h^2 = da^2 - a^2$$

Iz trokuta T'TbT visina  $h$  iznosi:

$$h^2 = db^2 - b^2$$



$$h^2 = da^2 - a^2 = db^2 - b^2$$

$$da^2 - db^2 = a^2 - b^2$$

ili

$$(a + b)(a - b) = (da + db)(da - db)$$

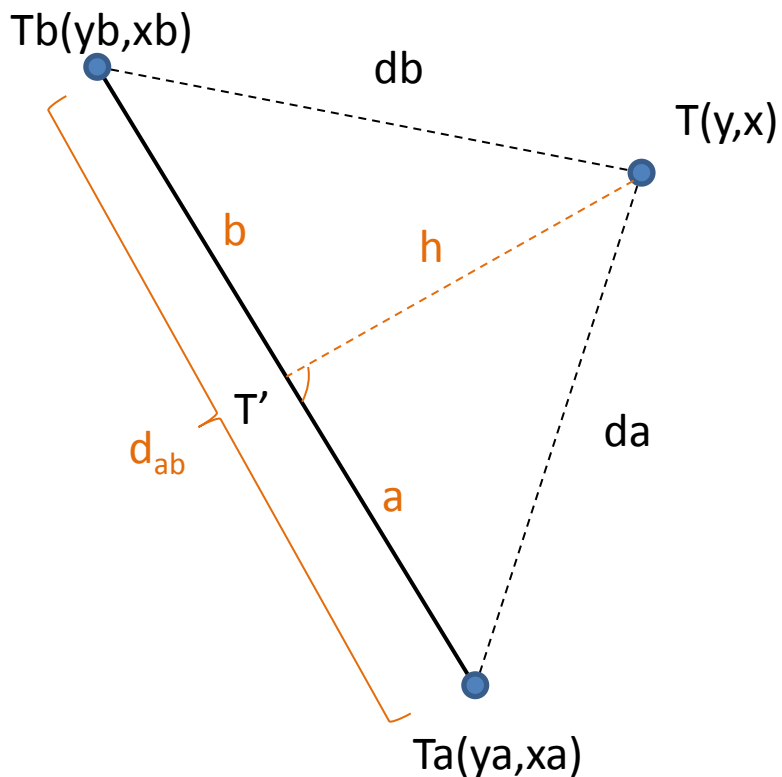
$$(a + b)(a - b) = (da + db)(da - db)$$

$$(a - b) = \frac{(da + db)(da - db)}{(a + b)}$$

$$\frac{a - b}{2} = \frac{(da + db)(da - db)}{2(a + b)}$$

2





$$\frac{a - b}{2} = \frac{(da + db)(da - db)}{2(a + b)}$$

2

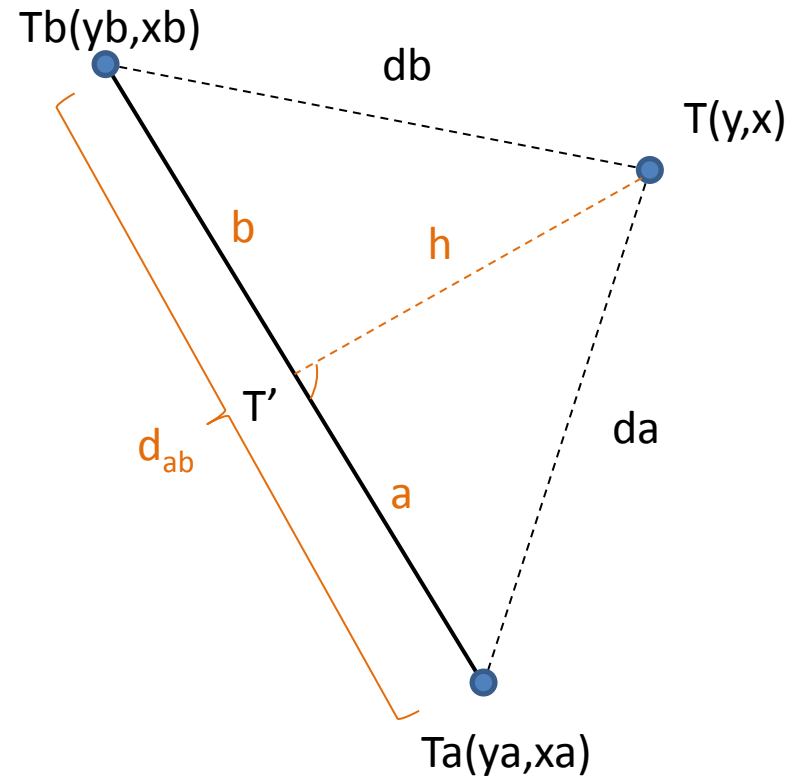
ya	1258,64	xa	1568,35
yb	921,52	xb	1763,67
yb-ya	-337,12	xb-xa	195,32
d=(a+b)	389,614934		
(a+b)/2=	194,807467		
da=	336,32	db=	276,16
<b>(a-b)/2=</b>	<b>47,29</b>		

$$\textcircled{1} \quad \frac{a+b}{2} = \frac{1}{2} \sqrt{(yb - ya)^2 + (xb - xa)^2}$$

$$\textcircled{2} \quad \frac{a-b}{2} = \frac{(da + db)(da - db)}{2(a+b)}$$

Iz jednadžbi (1) i (2) proizlazi:

$$\textcircled{3} \quad \mathbf{a} = \frac{a+b}{2} + \frac{a-b}{2} \qquad \mathbf{b} = \frac{a+b}{2} - \frac{a-b}{2}$$





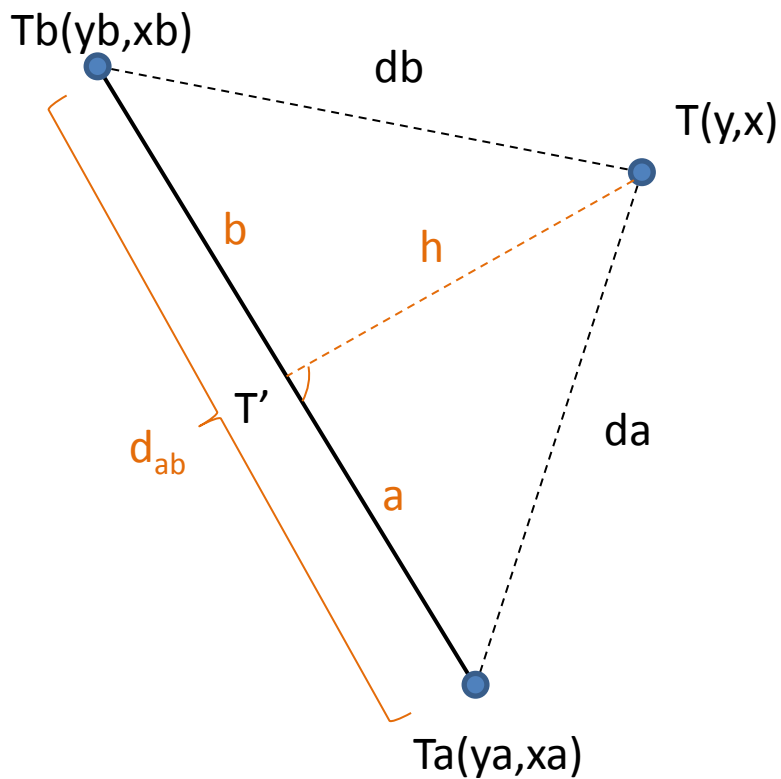


Veličina **h** jednaka je:

$$h^2 = da^2 - a^2 = db^2 - b^2$$

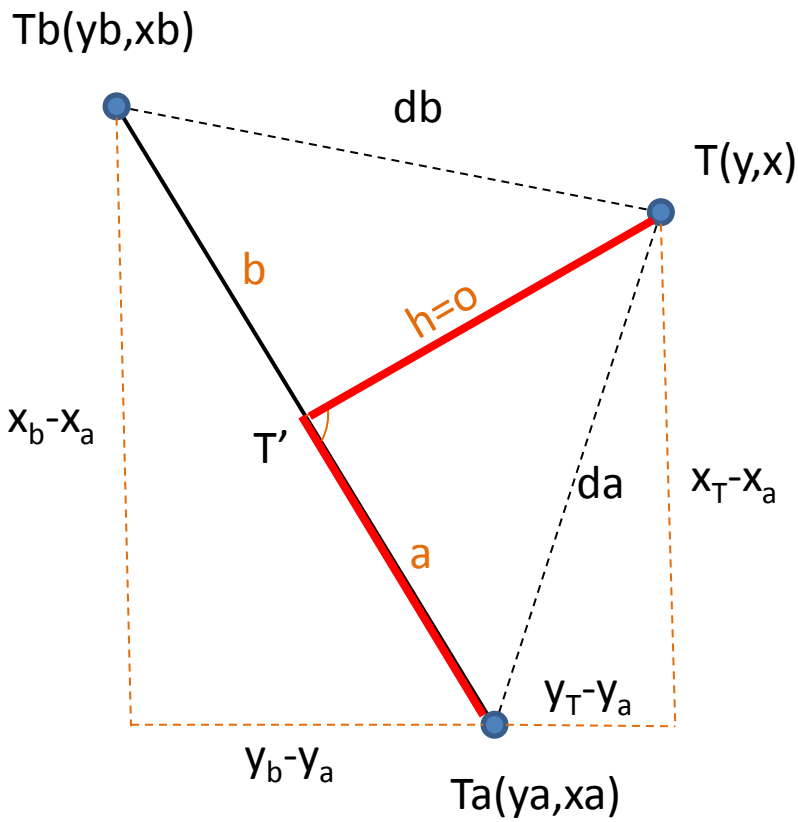
$$h = \sqrt{da^2 - a^2} = \sqrt{db^2 - b^2}$$

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LUČNI PRESJEK			
ya	1258,64	xa	1568,35
yb	921,52	xb	1763,67
yb-ya	-337,12	xb-xa	195,32
d=(a+b)	389,614934		
(a+b)/2=	194,807467		
da=	336,32	db=	276,16
(a-b)/2=	47,29		
a=	242,09		
b=	147,52		
h <sup>2</sup> =da <sup>2</sup> -a <sup>2</sup>	54501,81	h <sup>2</sup> =db <sup>2</sup> -b <sup>2</sup>	54501,81
<b>h</b>	<b>233,46</b>	<b>h</b>	<b>233,46</b>

Koordinate točke T izračunati ćemo kao da se radi o detaljnoj točki s apscisom **a** i ordinatom **o** (**h**).



Prema formulama za računanje koordinata detaljnih točaka slijedi:

$$\frac{y_b - y_a}{a + b} = p \quad \frac{x_b - x_a}{a + b} = q \quad \text{5}$$

$y_T - y_a = a \cdot p - h \cdot q$	$x_T = x_a + a \cdot q + h \cdot p$
-------------------------------------	-------------------------------------

$y_T = y_a + a \cdot p - h \cdot q$	$x_T = x_a + a \cdot q + h \cdot p$
-------------------------------------	-------------------------------------

*Napomena: za o (h) uzima se pozitivan predznak ako točka T leži lijevo od dužine TaTb, a negativan ako točka leži desno od nje.*

## LUČNI PRESJEK

	<b>ya</b>	<b>1258,64</b>	<b>xa</b>		<b>1568,35</b>
	<b>yb</b>	<b>921,52</b>	<b>xb</b>		<b>1763,67</b>
	yb-ya	-337,12	xb-xa		195,32
	d=(a+b)	389,614934			
①	<b>(a+b)/2=</b>	194,807467			
	<b>da=</b>	<b>276,16</b>	<b>db=</b>		<b>336,32</b>
②	<b>(a-b)/2=</b>	-47,29			
③	a=	147,52			
3	b=	242,09			
	h <sup>2</sup> =da <sup>2</sup> -a <sup>2</sup>	54501,81	h <sup>2</sup> =db <sup>2</sup> -b <sup>2</sup>		54501,81
④	h	233,46	h		233,46
Računanje koordinata detaljne točke - apscisa a i ordinata o (h)					
	PREDZNAK = ordinata o (h) nalazi se s lijeve strane =1, a s desne strane -1				-1
⑤	p = (yb-ya)/(a+b)		-0,86526	p <sup>2</sup>	0,74868278
5	q = (xb-xa)/(a+b)		0,501315	q <sup>2</sup>	0,25131722
			p <sup>2</sup> + q <sup>2</sup>		1
⑥	<b>y<sub>T</sub></b>	<b>1248,03</b>	<b>x<sub>T</sub></b>		<b>1844,31</b>
	Kontrola		d <sub>a</sub> 276,16	d <sub>b</sub>	336,32

$$d = (a + b) = \sqrt{(yb - ya)^2 + (xb - xa)^2}$$

$$\frac{a + b}{2} = \frac{1}{2} \sqrt{(yb - ya)^2 + (xb - xa)^2} \quad \text{①}$$

$$\frac{a - b}{2} = \frac{(da + db)(da - db)}{2(a + b)} \quad \text{②}$$

$$a = \frac{a+b}{2} + \frac{a-b}{2} \quad b = \frac{a+b}{2} - \frac{a-b}{2} \quad \text{③}$$

$$h = \sqrt{da^2 - a^2} = \sqrt{db^2 - b^2} \quad \text{④}$$

$$\frac{y_b - y_a}{a + b} = p \quad \frac{x_b - x_a}{a + b} = q \quad \text{⑤}$$

$$y_T = y_a + a \cdot p - h \cdot q \quad x_T = x_a + a \cdot q + h \cdot p \quad \text{⑥}$$

Ako ti je ova prezentacija koristila pošalji mail: [slavicek@geoskola.hr](mailto:slavicek@geoskola.hr)