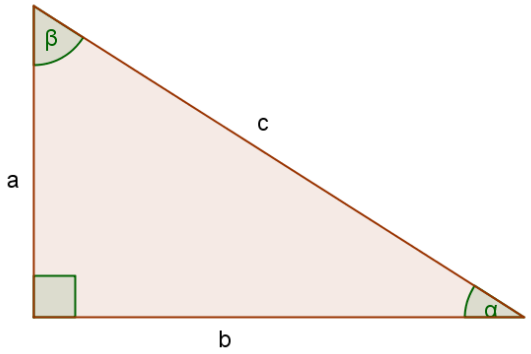
**Ponavljanje za pismeni ispit – trigonometrija pravokutnog trokuta**

1. Izračunaj kutove, opseg i površinu pravokutnog trokuta u kojem je duljina jedne katete b = 34, a hipotenuze c = 50.




$\cos\alpha = \frac{b}{c} = \frac{34}{50}$

$\boxed{\alpha = 47°9'23''}$

$\beta = 90° - \alpha = 89°59'60'' - 47°9'23''$

$\boxed{\beta = 42°50'37''}$

$a^2 = c^2 - b^2$

$a = \sqrt{c^2 - b^2} = \sqrt{50^2 - 34^2} = \sqrt{2500 - 1156} = \sqrt{1344}$

$\boxed{a = 36.66}$

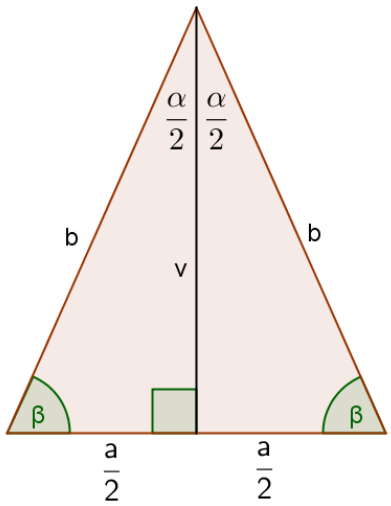
$O = a + b + c = 36.66 + 34 + 50$

$\boxed{O = 120.66}$

$P = \frac{a \cdot b}{2} = \frac{36.66 \cdot 34}{2}$

$\boxed{P = 628.32}$

2. Izračunaj opseg i površinu jednakokračnog trokuta osnovice a = 58 cm i kuta nasuprot osnovice α = 76°16'.




$\sin\frac{\alpha}{2} = \frac{\frac{a}{2}}{b} = \frac{a}{2b}$

$2b = \frac{a}{\sin\frac{\alpha}{2}} = \frac{58}{\sin 38°8'} = 93.93$

$\boxed{b = 46.96\ \text{cm}}$

$$\operatorname{tg}\frac{\alpha}{2} = \frac{\frac{a}{2}}{v} = \frac{a}{2v}$$

$$2v = \frac{a}{\operatorname{tg}\frac{\alpha}{2}} = \frac{58}{\operatorname{tg}38°8'} = 73.88$$

$\boxed{v = 36.94\ \text{cm}}$

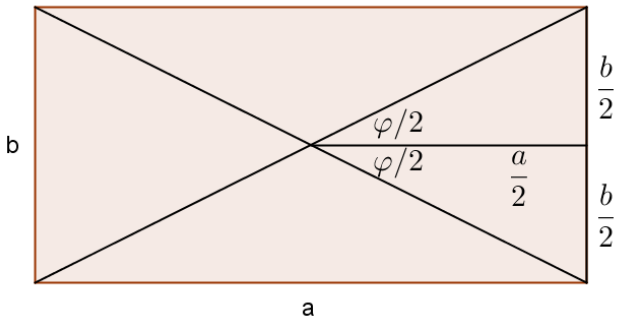
$O = a + 2b = 58 + 93.92$

$\boxed{O = 115.92\ \text{cm}}$

$$P = \frac{a \cdot v}{2} = \frac{58 \cdot 36.94}{2}$$

$\boxed{P = 1071.26\ \text{cm}^2}$

3. Izračunaj površinu pravokutnika s duljom stranicom a = 14.3 cm i kutom među dijagonalama φ = 23°16'.




$$\operatorname{tg}\frac{\varphi}{2} = \frac{\frac{b}{2}}{\frac{a}{2}} = \frac{b}{a}$$

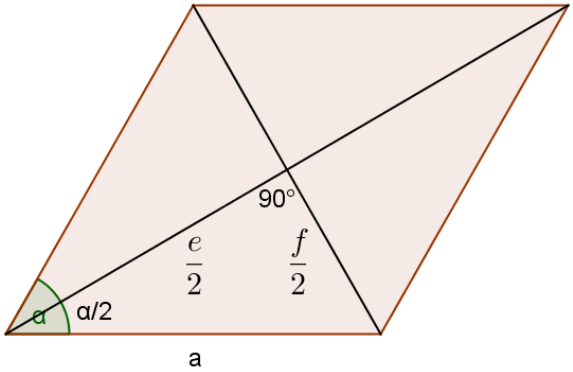
$$b = a \cdot \operatorname{tg}\frac{\varphi}{2} = 14.3 \cdot \operatorname{tg}11°38'$$

$\boxed{b = 2.94\ \text{cm}}$

$P = a \cdot b = 14.3 \cdot 2.94$

$\boxed{P = 42.04\ \text{cm}^2}$

4. Izračunaj šiljasti kut, stranicu i površinu romba čije su dijagonale duge 13 cm i 9.12 cm.



$$\operatorname{tg}\frac{\alpha}{2} = \frac{\frac{f}{2}}{\frac{e}{2}} = \frac{f}{e} = \frac{9.12}{13} = 0.70154$$

$$\frac{\alpha}{2} = 35°3'$$

$$\boxed{\alpha = 70°6'}$$

$$a^2 = \left(\frac{e}{2}\right)^2 + \left(\frac{f}{2}\right)^2$$

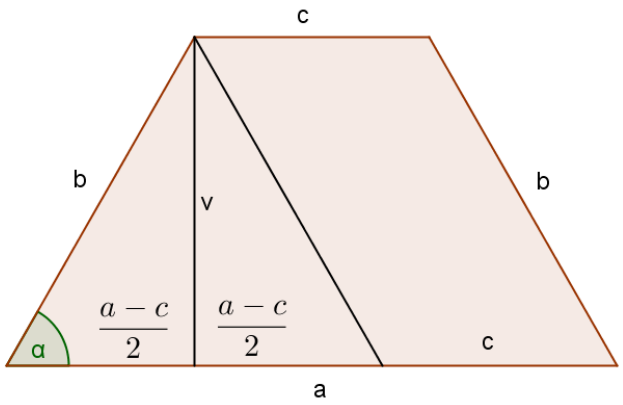
$$a = \sqrt{\left(\frac{e}{2}\right)^2 + \left(\frac{f}{2}\right)^2} = \sqrt{6.5^2 + 4.56^2} = \sqrt{42.25 + 20.7936} = \sqrt{63.0436}$$

$$\boxed{a = 7.94 \text{ cm}}$$

$$P = \frac{e \cdot f}{2} = \frac{13 \cdot 9.12}{2}$$

$$\boxed{P = 59.28 \text{ cm}^2}$$

5. Izračunaj površinu jednakokračnog trapeza s osnovicama duljine 19 i 13 cm, ako krak trapeza s osnovicom zatvara kut α = 67°28'.




$$\operatorname{tg}\alpha = \frac{v}{\frac{a-c}{2}}$$

$$v = \frac{a-c}{2} \cdot \operatorname{tg}\alpha = 3 \cdot \operatorname{tg} 67°28'$$

$$\boxed{v = 7.23 \text{ cm}}$$

$$P = \frac{a+c}{2} \cdot v = \frac{19+13}{2} \cdot 7.23$$

$$\boxed{P = 115.68 \text{ cm}^2}$$