

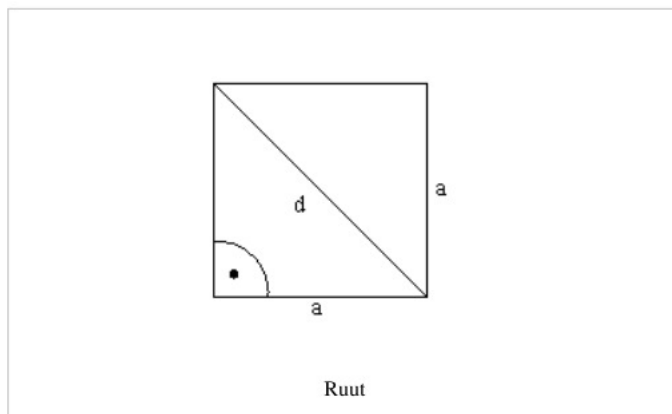
Matemaatika:Kordamine eksamik/Gümnaasium/Geomeetria tasandil

Valemid

Ruut

$$d = a\sqrt{2}$$

$$S = a^2$$



Kolmnurk

$$S = \frac{b * h}{2} = \frac{a * b * \sin \gamma}{2}$$

$$S = \sqrt{p(p-a)(p-b)(p-c)}, \text{ kus}$$

$$p = \frac{1}{2}(a + b + c)$$

$$\left. \begin{aligned} a^2 &= b^2 + c^2 - 2bc * \cos \alpha \\ b^2 &= a^2 + c^2 - 2ac * \cos \beta \\ c^2 &= a^2 + b^2 - 2ab * \cos \gamma \end{aligned} \right\} \text{ Koosinusteoreem}$$

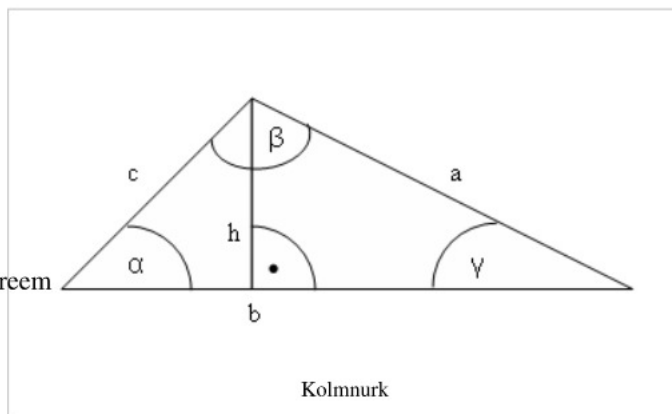
[1]

$$\frac{a}{\sin \alpha} = \frac{b}{\sin \beta} = \frac{c}{\sin \gamma} = 2R \text{ Siinusteoreem}$$

[2]

$$\alpha + \beta + \gamma = 180^0$$

R - ümberringjoone raadius



Täisnurkne kolmnurk

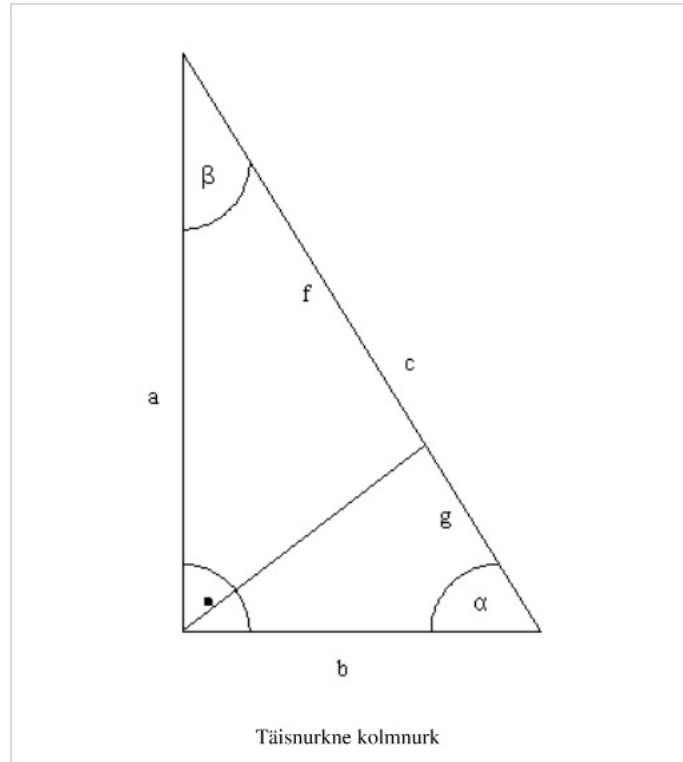
$a^2 + b^2 = c^2 \Rightarrow c = \sqrt{a^2 + b^2}$ Pythagorase teoreem^[3]

$$S = \frac{ab}{2} = \frac{ch}{2}$$

$$\sin\alpha = \frac{a}{c} = \cos\beta$$

$$\cos\alpha = \frac{b}{c} = \sin\beta$$

$$\tan\alpha = \frac{a}{b}$$



$$\alpha + \beta = 90^\circ$$

$$a^2 = f * c; \quad \sin(90^\circ - \alpha) = \cos\alpha$$

$$b^2 = g * c; \quad \cos(90^\circ - \alpha) = \sin\alpha$$

$$h^2 = f * g; \quad \tan(90^\circ - \alpha) = \frac{1}{\tan\alpha}$$

Ringjoon, ring, sektor

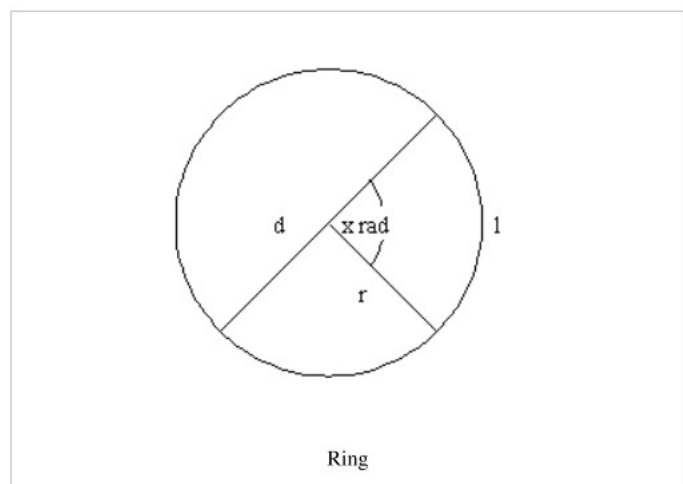
$C = 2 * \pi * r = \pi * d$, C on ümberringjoone pikkus

$$S = \pi * r^2 = \frac{\pi * d^2}{4}, S \text{ on täispindala}$$

$$S_s = \frac{\pi * r^2}{2\pi} * x = \frac{x * r^2}{2} = \frac{l * r}{2}, S_s$$

on sektori pinda

$$l = \frac{2 * \pi * r}{2\pi} * x = x * r, l \text{ on sektori kaare pikkus}$$

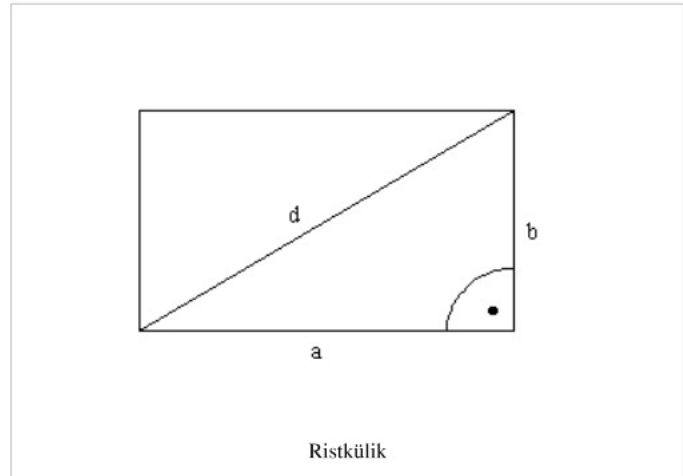


Ristkülik

$$d = \sqrt{a^2 + b^2}$$

$$S = a * b$$

$$P = 2(a + b)$$

**Romb**

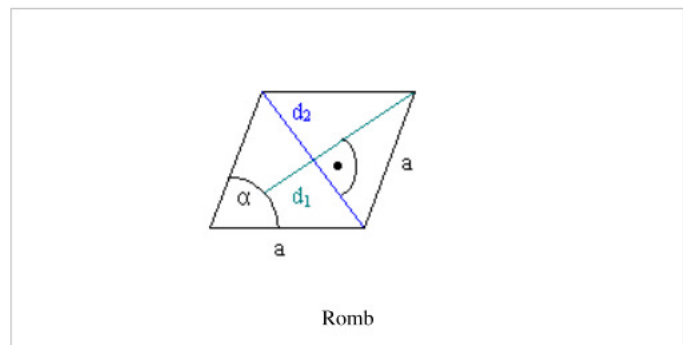
$$S = a * h$$

$$S = a^2 \sin \alpha$$

$$S = \frac{1}{2} d_1 d_2$$

Näited

1. Rombi ümber asetseb minimaalse suurusega ring. Leia mitu korda on romb ringist väiksem, kui antud on rombi lühem diagonaal ja alus.



$$h = \sqrt{d_2^2 - \frac{a^2}{4}}$$

$$S_{\text{romb}} = a * \sqrt{d_2^2 - \frac{a^2}{4}}$$

$$d_1 = \frac{a * \sqrt{d_2^2 - \frac{a^2}{4}}}{d_2}$$

$$r = \frac{\frac{a * \sqrt{d_2^2 - \frac{a^2}{4}}}{d_2}}{2}$$

$$S_{\text{ring}} = \pi * \frac{\frac{a * \sqrt{d_2^2 - \frac{a^2}{4}}}{d_2}}{2}$$

$$x = \frac{S_{\text{ring}}}{S_{\text{romb}}} \Rightarrow x = \frac{\pi * \frac{\frac{a * \sqrt{d_2^2 - \frac{a^2}{4}}}{d_2}}{2}}{a * \sqrt{d_2^2 - \frac{a^2}{4}}} \Rightarrow x = \pi * \frac{4a^2 * \frac{d_2^2 - \frac{a^2}{4}}{d_2^2}}{a * \sqrt{d_2^2 - \frac{a^2}{4}}} \Rightarrow$$

$$\Rightarrow x = 4\pi a \frac{(d_2^2 - \frac{a^2}{4}) * \sqrt{d_2^2 - \frac{a^2}{4}}}{d_2^2} \Rightarrow$$

$$\Rightarrow x = \left(4\pi a - \frac{\pi a^3}{d_2^2}\right) \sqrt{d_2^2 + \frac{a^2}{4}}$$

Vastus: Romb on ringist $\left(4\pi a - \frac{\pi a^3}{d_2^2}\right) \sqrt{d_2^2 + \frac{a^2}{4}}$ korda väiksem.

Viited

- [1] <http://et.wikipedia.org/wiki/Koosinusteoreem>
- [2] <http://et.wikipedia.org/wiki/Siinusteoreem>
- [3] http://et.wikipedia.org/wiki/Pythagorase_teoreem