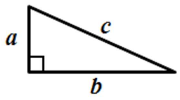
Formule - geometrijski likovi - osnovna škola

Oznake:
O – opseg,
P – površina,
d – duljina dijagonale,
v– visina,
R – radijus (polumjer) opisane kružnice,
r – radijus (polumjer) upisane kružnice

Pitagorin poučak



$c^2 = a^2 + b^2$

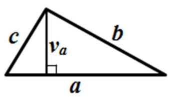
$c = \sqrt{a^2 + b^2}$

$a = \sqrt{c^2 - b^2}$

$b = \sqrt{c^2 - a^2}$

Trokuti

raznostranični trokut



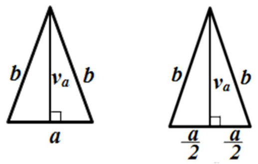
$O = a + b + c$

$P = \frac{a \cdot v_a}{2}$

$P = \frac{b \cdot v_b}{2}$

$P = \frac{c \cdot v_c}{2}$

jednakokračni trokut



$O = a + 2b$

$P = \frac{a \cdot v_a}{2}$

$v_a = \sqrt{b^2 - \left(\frac{a}{2}\right)^2}$

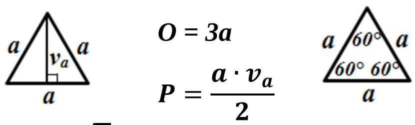
$b = \sqrt{\left(\frac{a}{2}\right)^2 + v_a^2}$

$\frac{a}{2} = \sqrt{b^2 - v_a^2}$

a - osnovica
b - kraci

Kutovi uz osnovicu su jednaki.

jednakostranični trokut



$O = 3a$

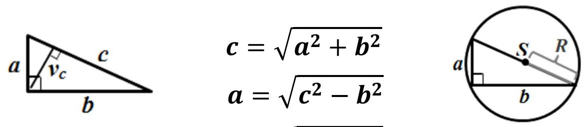
$P = \frac{a \cdot v_a}{2}$

$v_a = \frac{a\sqrt{3}}{2}$

$P = \frac{a^2\sqrt{3}}{4}$

Zbroj kutova trokuta je (uvijek) 180°.

pravokutni trokut



$O = a + b + c$

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

$P = \frac{c \cdot v_c}{2}$

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

$a = \sqrt{c^2 - b^2}$

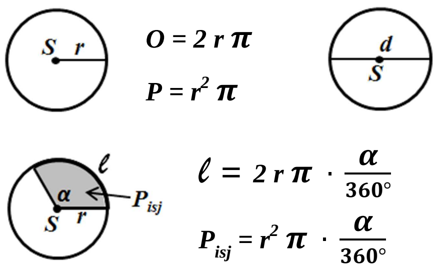
$b = \sqrt{c^2 - a^2}$

$R = \frac{c}{2}$

a, b - katete (stranice uz pravi kut)
c - hipotenuza (stranica nasuprot pravom kutu)

Krug

krug



$O = 2\, r\, \pi$

$P = r^2\, \pi$

$d = 2r$

d - promjer (dijametar) kruga

$\ell = 2\, r\, \pi \cdot \frac{\alpha}{360°}$

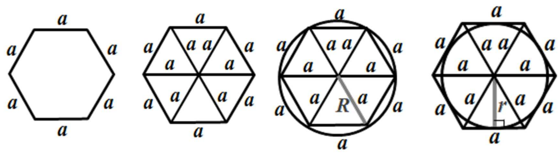
$P_{isj} = r^2\, \pi \cdot \frac{\alpha}{360°}$

ℓ - duljina kružnog luka

P_{isj} - površina kružnog isječka

Šesterokut

pravilni šesterokut



$O = 6a$

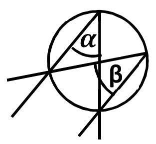
$d = 2a$

$R = a$

$r = \frac{a\sqrt{3}}{2}$

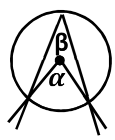
$P = 6 \cdot \frac{a^2\sqrt{3}}{4}$

O obodnim i središnjim kutovima



$\alpha = \beta$

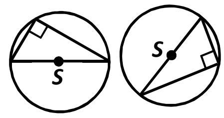
Obodni kutovi nad istim lukom su jednaki.



$\alpha = 2\beta$

Središnji kut je 2 puta veći od obodnog kuta nad istim lukom.

Talesov poučak



Svaki obodni kut nad promjerom kruga ima 90°.

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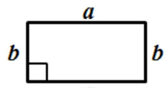
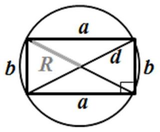
Četverokuti

pravokutnik





Pravokutnik nema upisanu kružnicu, osim ako je kvadrat.

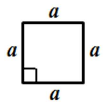
$O = 2a + 2b$

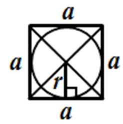
$P = a \cdot b$

$R = \frac{d}{2}$

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

kvadrat





$r = \frac{a}{2}$

$O = 4a$

$P = a^2$

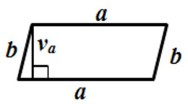
$P = \frac{d^2}{2}$

$d = a\sqrt{2}$

$R = \frac{d}{2}$

Dijagonale kvadrata:
- jednako su duge,
- raspolavljaju se,
- sijeku se pod pravim kutem.

paralelogram



$O = 2a + 2b$

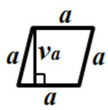
$P = a \cdot v_a$

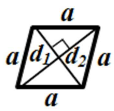
$P = b \cdot v_b$

Nausprotni kutovi su sukladni (jednakih veličina), a susjedni suplementarni (zbroj im je 180°).

Paralelogram (općenito) nema opisanu ni upisanu kružnicu.

romb





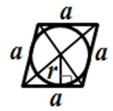
$a = \sqrt{\left(\frac{d_1}{2}\right)^2 + \left(\frac{d_2}{2}\right)^2}$

Dijagonale romba:
- raspolavljaju se,
- sijeku se pod pravim kutem.

$O = 4a$

$P = a \cdot v_a$

$P = \frac{d_1 \cdot d_2}{2}$

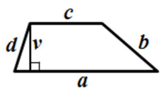


$r = \frac{v_a}{2}$

Romb nema opisanu kružnicu, osim ako je kvadrat.

Nausprotni kutovi su sukladni (jednakih veličina), a susjedni suplementarni (zbroj im je 180°).

trapez

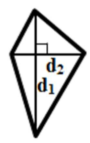


$O = a + b + c + d$

$P = \frac{(a + c) \cdot v}{2}$

a, c - osnovice (paralelne stranice)
b, d - kraci

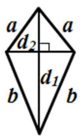
četverokuti s okomitim dijagonalama



$P = \frac{d_1 \cdot d_2}{2}$

U četverokute s okomitim dijagonalama (između ostalih) spadaju:
- kvadrat,
- romb,
- deltoid.

deltoid



$O = 2a + 2b$

$P = \frac{d_1 \cdot d_2}{2}$

Zbroj kutova četverokuta je (uvijek) 360°.

Mnogokuti (općenito)

n-terokut

$O = a_1 + a_2 + a_3 + \ldots + a_n$

$K_n = (n - 2) \cdot 180°$

$d_n = n - 3$

$D_n = \frac{n \cdot (n - 3)}{2}$

n - broj vrhova,
K_n - zbroj kutova,
d_n - broj dijagonala iz jednog vrha,
D_n - ukupan broj dijagonala tog n-terokuta

Zbroj vanjskih kutova je uvijek 360°.

pravilni n-terokut

$O = n \cdot a$

$\alpha = \frac{K_n}{n}$

$\alpha = \frac{(n - 2) \cdot 180°}{n}$

n - broj vrhova,
α - veličina kuta pravilnog n-terokuta