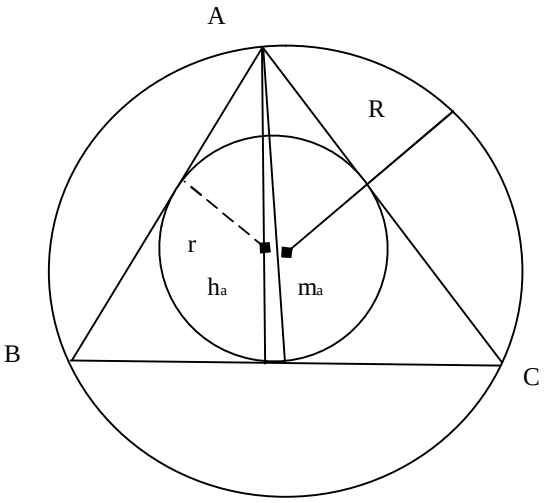
Aplicatii ale trigonometriei in geometrie

1. Notatii: In Δ **ABC** avem urmatoarele notatii:



Masurile unghiurilor $\hat{A}, \hat{B}, \hat{C}$ se noteaza **m($\hat{A}$) = A, m($\hat{B}$) = B, m($\hat{C}$) = C.**

Lungimile laturilor opuse ungiurilor $\hat{A}, \hat{B}, \hat{C}$ se noteaza cu **a, b, c,** adica **AB= c, AC= b, BC= a, 2p = a+ b+ c (p** este **semiperimetrul Δ ABC) ,**
S = aria Δ ABC.
Lungimile medianelor duse din varfurile **A, B, C** se noteaza cu $\mathbf{m_a}$, $\mathbf{m_b}$ respectiv $\mathbf{m_c}$.
Lungimile inaltimilor duse din varfurile **A, B, C** se noteaza cu $\mathbf{h_a}$, $\mathbf{h_b}$ respectiv $\mathbf{h_c}$.
Raza cercului circumscris Δ ABC se noteaza cu **R.**
Raza cercului inscris in Δ ABC se noteaza cu **r.**

2. **Teorema sinusurilor:** $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C} = 2R.$

3. **Teorema medianei:** $m_a^2 = \frac{2(b^2+c^2)-a^2}{4}$, $m_b^2 = \frac{2(a^2+c^2)-b^2}{4}$, $m_c^2 = \frac{2(a^2+b^2)-c^2}{4}$.

4. **Teorema cosinusului:** $a^2 = b^2+c^2-2bc\cdot\cos A$, $b^2 = a^2+c^2-2ac\cdot\cos B$, $c^2 = a^2+b^2-2ab\cdot\cos C$.

5. $S = \frac{ah_a}{2} = \frac{bh_b}{2} = \frac{ch_c}{2}$.

6. $S = \frac{ac\sin B}{2} = \frac{ab\sin C}{2} = \frac{bc\sin A}{2}$.

7. $S = \frac{a^2\sin B\sin C}{2\sin A} = \frac{b^2\sin A\sin C}{2\sin B} = \frac{c^2\sin A\sin B}{2\sin C}$.

8. **Formula lui Heron: $S = \sqrt{p(p-a)(p-b)(p-c)}$.**

9. **$S = rp$.**

10. **$S = \frac{abc}{4R}$.**

11. **$\sin \frac{A}{2} = \sqrt{\frac{(p-b)(p-c)}{bc}}$, $\cos \frac{A}{2} = \sqrt{\frac{p(p-a)}{bc}}$.**