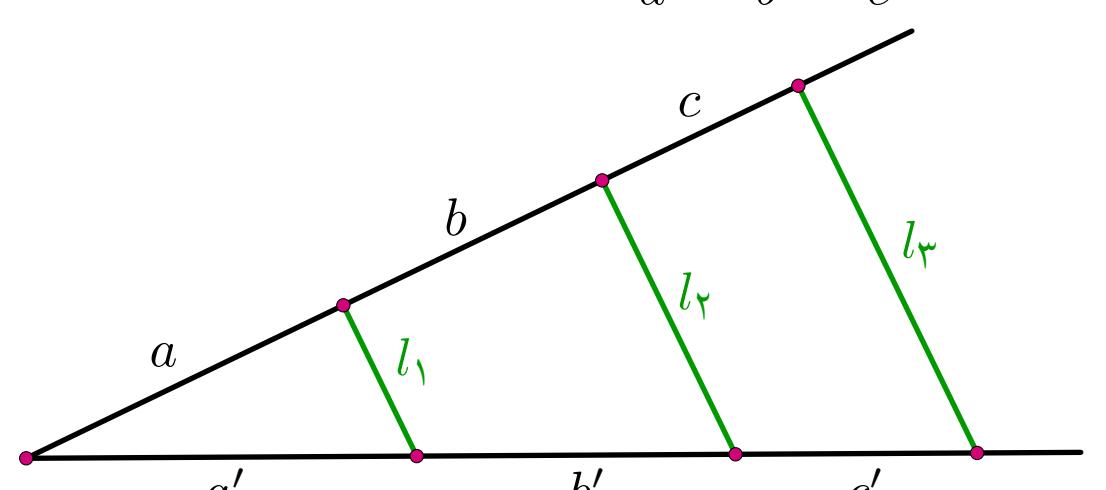
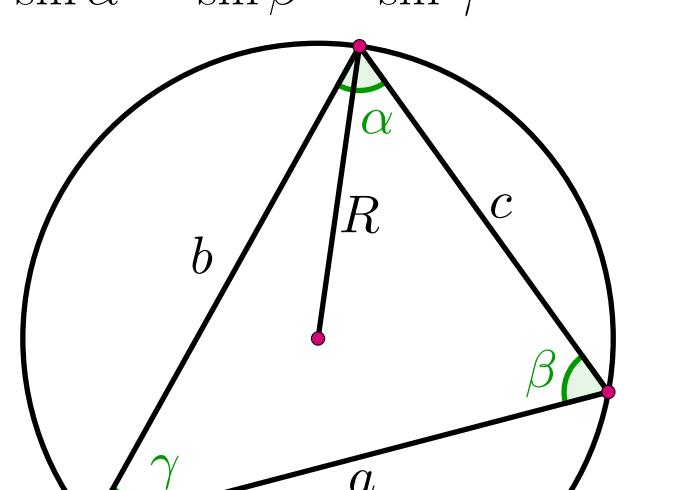


قضیه تالس

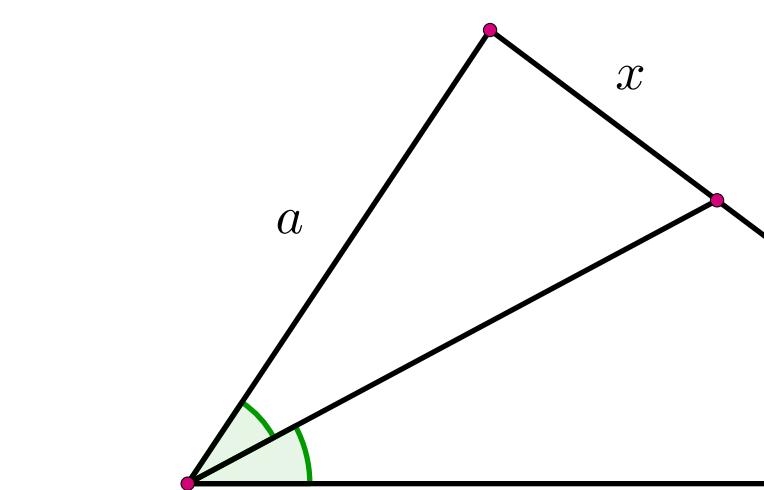
$$l_1 \parallel l_2 \parallel l_3 \iff \frac{a}{a'} = \frac{b}{b'} = \frac{c}{c'}$$


قضیه سینوس‌ها

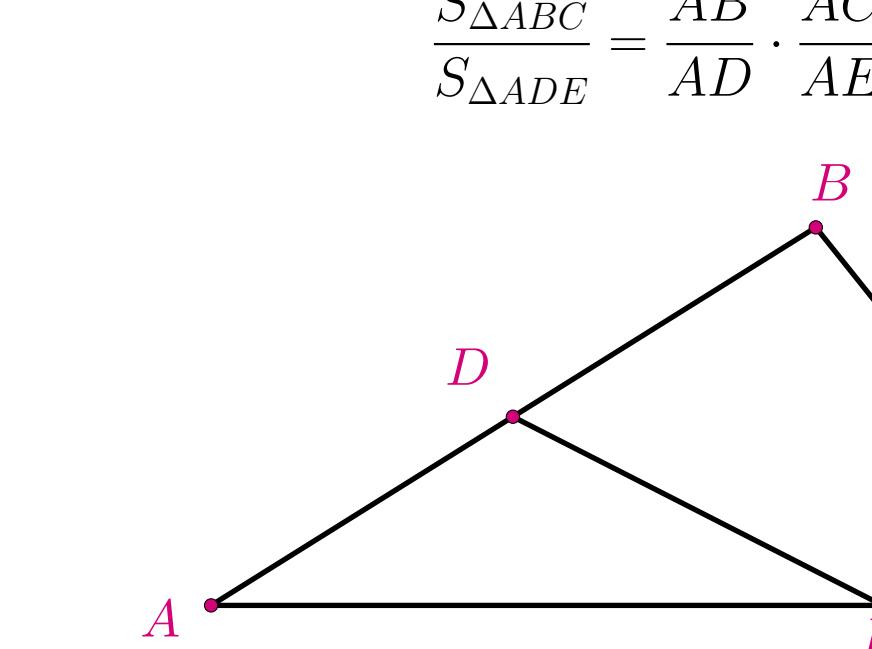
$$\frac{a}{\sin \alpha} = \frac{b}{\sin \beta} = \frac{c}{\sin \gamma} = 2R$$


قضیه نیمساز

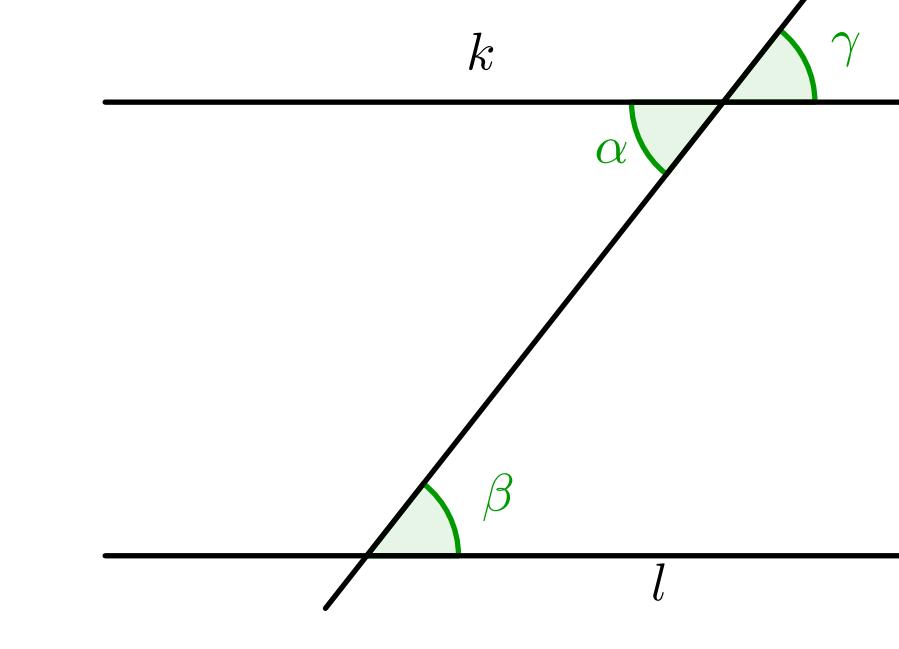
$$\frac{a}{b} = \frac{x}{y}$$


نسبت مساحت‌ها

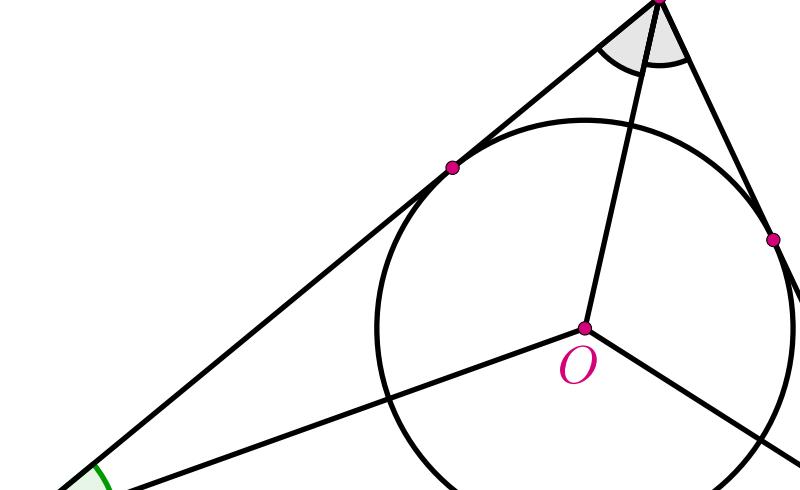
$$\frac{S_{\Delta ABC}}{S_{\Delta ADE}} = \frac{AB}{AD} \cdot \frac{AC}{AE}$$


زوايا در خطوط موازي

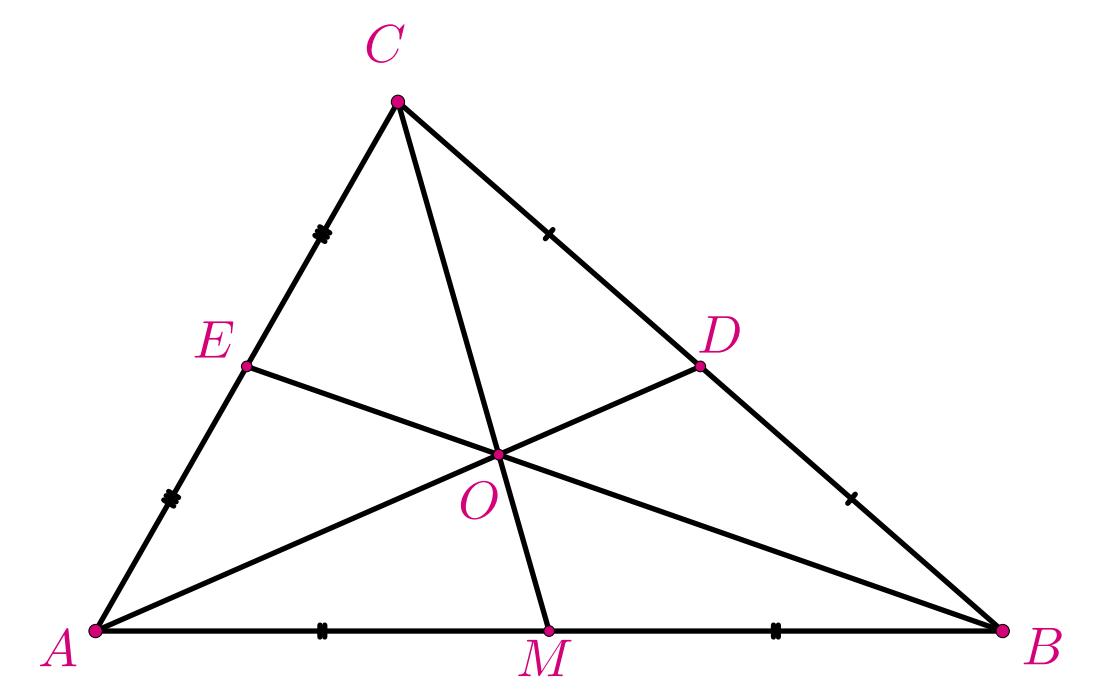
$$k \parallel l \iff \alpha = \beta = \gamma$$


دایره محاطی مثلث

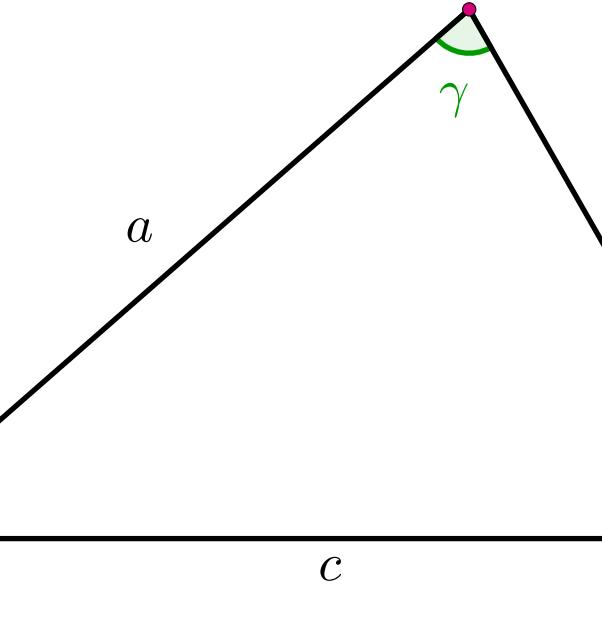
مرکز: محل برخورد نیمسازهای داخلی


نقطه برخورد میانه‌ها

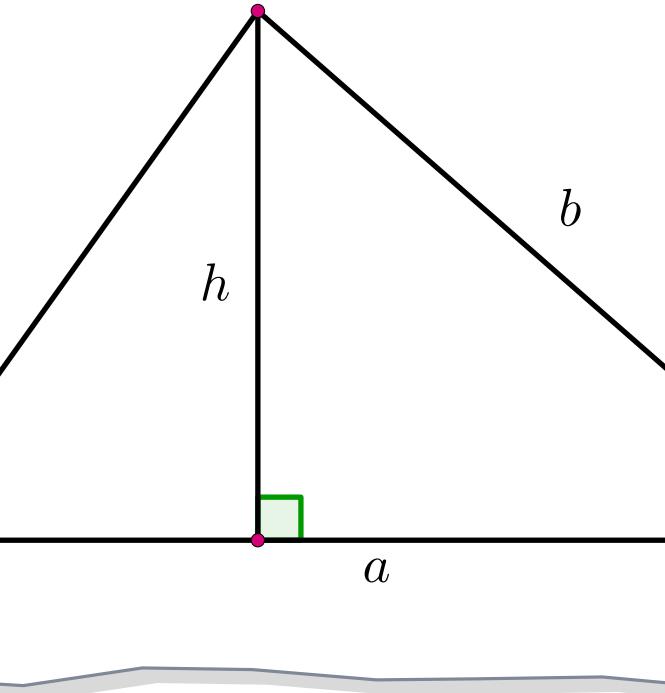
$$\frac{CO}{OM} = \frac{AO}{OD} = \frac{BO}{OE} = \frac{1}{2}$$


قضیه کسینوس‌ها

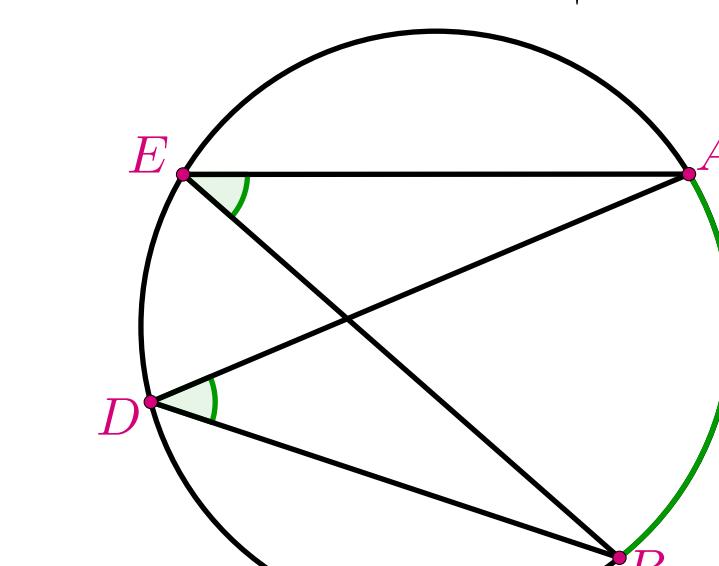
$$c^2 = a^2 + b^2 - 2ab \cdot \cos \gamma$$


مساحت مثلث

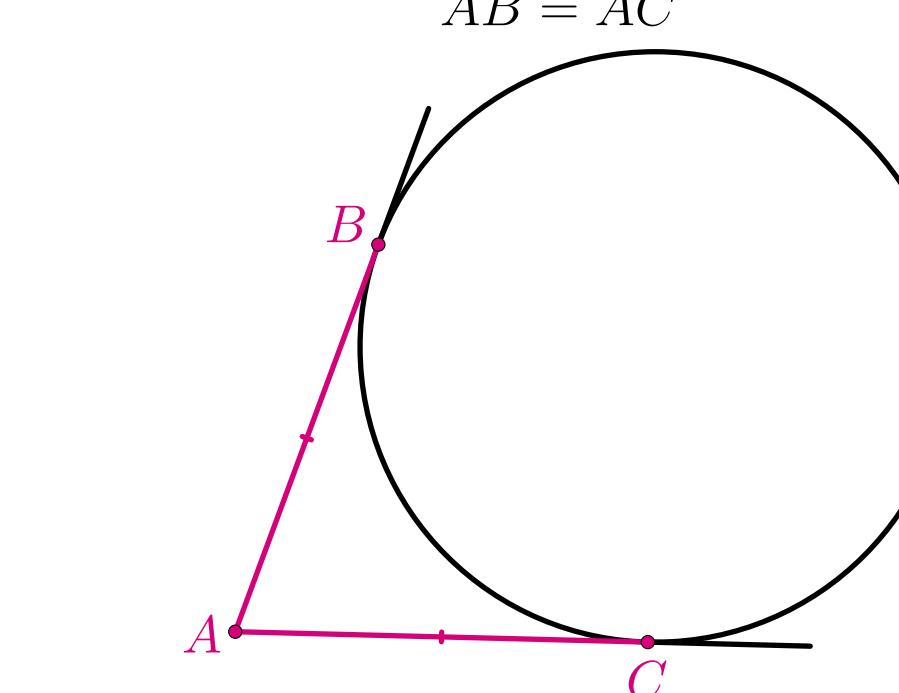
$$S_{\Delta} = \frac{1}{2} \cdot a \cdot h = \frac{1}{2} \cdot ab \cdot \sin \alpha$$


زوايا محاطي

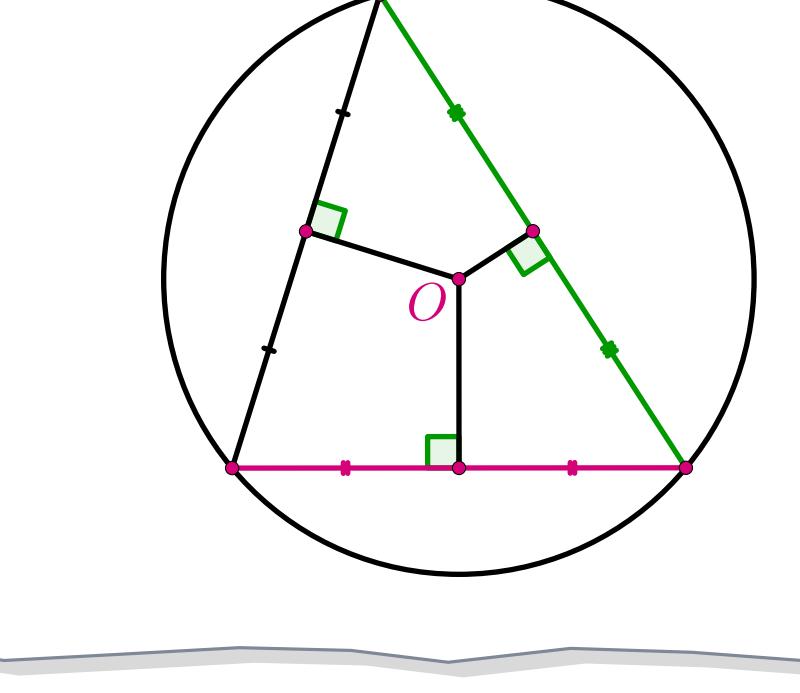
$$\angle AEB = \angle ADB = \frac{1}{2} \angle AB$$


دو مماس از یک نقطه

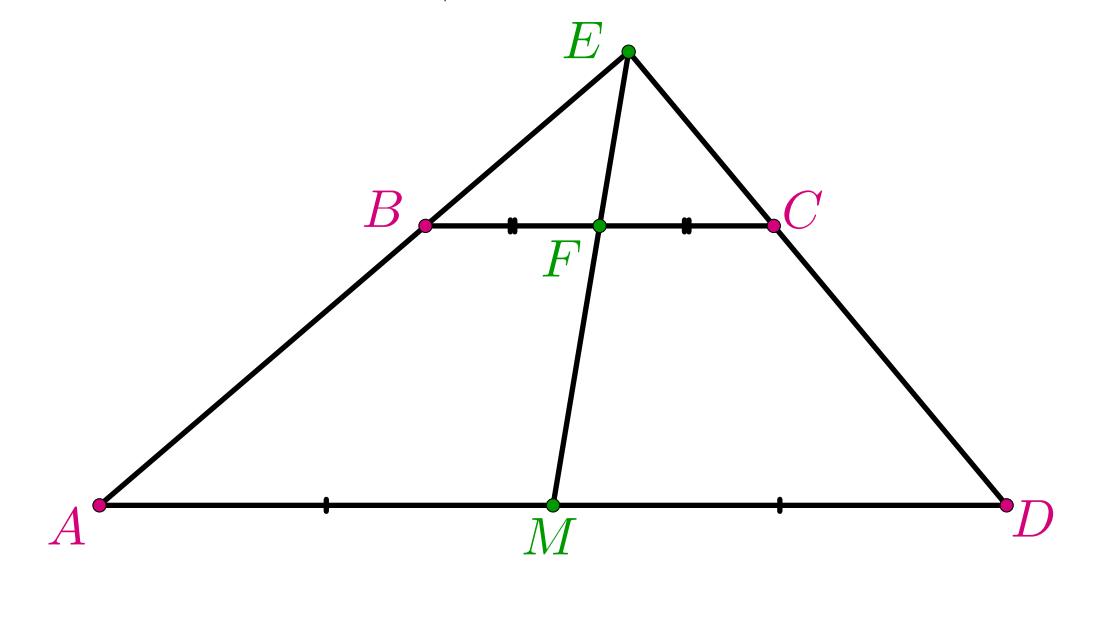
$$AB = AC$$


دایره محیطی مثلث

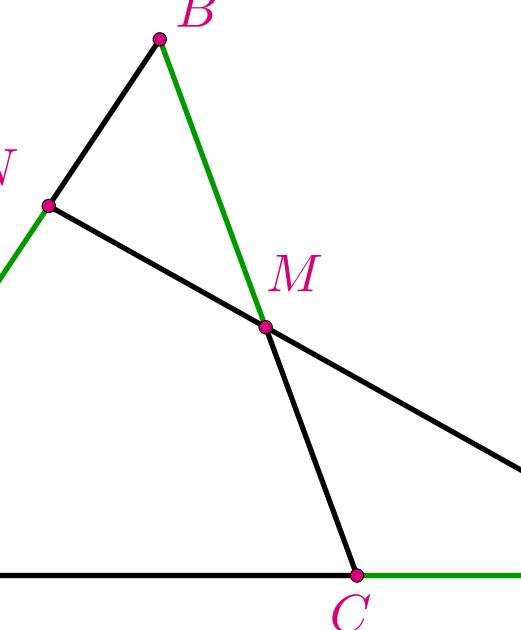
مرکز: محل برخورد عمودمنصفها


ویژگی خاص ذوزنقه

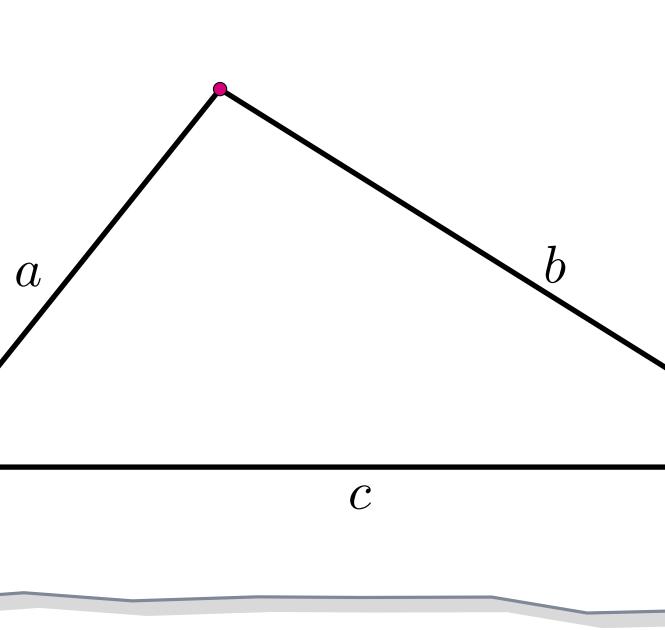
$ABCD$ ذوزنقه
وسط قاعده‌ای ذوزنقه E, F, M هم خط هستند


قضیه منلاقوس

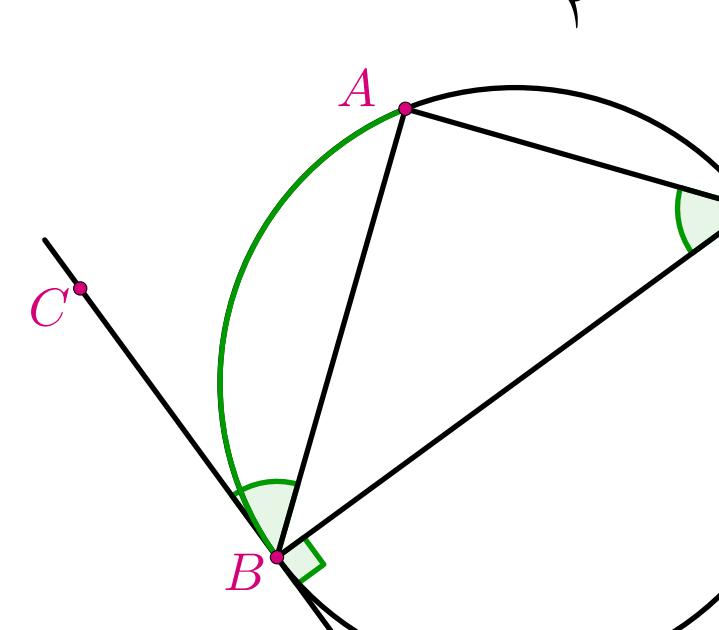
$$\frac{AN}{NB} \cdot \frac{BM}{MC} \cdot \frac{CK}{KA} = 1$$


فرمول هرون

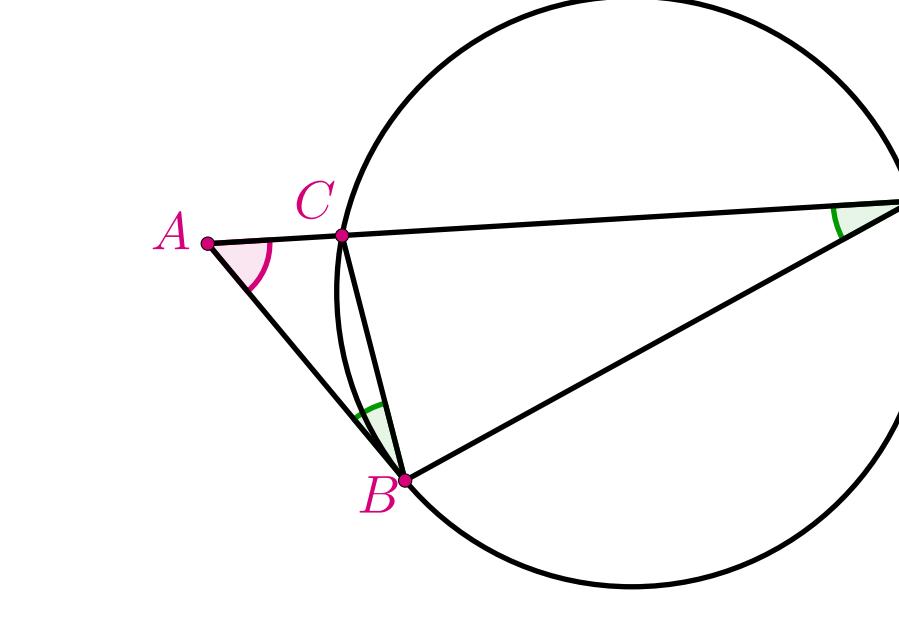
$$p = \frac{a+b+c}{2}, \\ S_{\Delta} = \sqrt{p(p-a)(p-b)(p-c)}$$


زاویه مماس و وتر

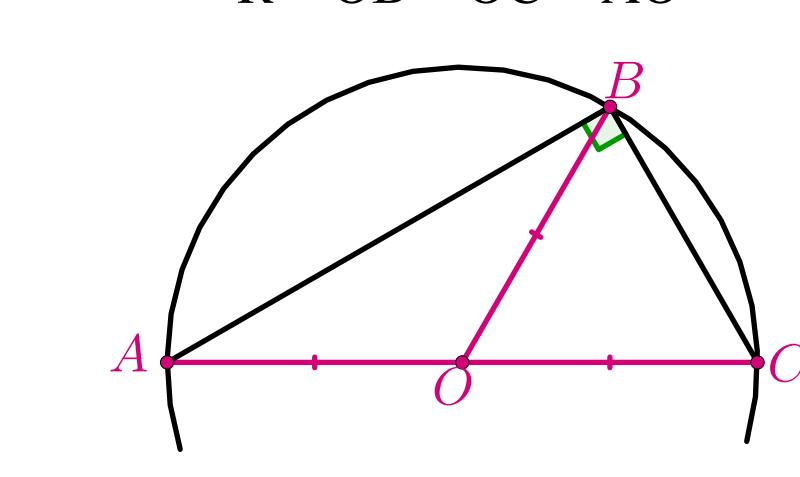
$$\angle ABC = \angle ADB = \frac{1}{2} \angle AB$$


رابطه مماس و قاطع

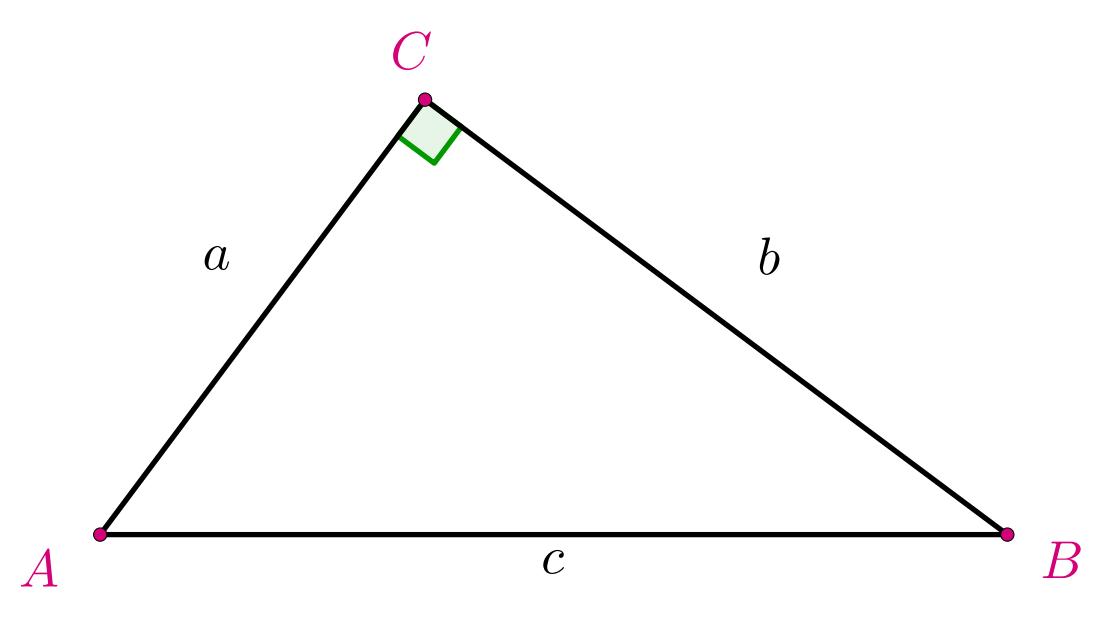
$$\Delta ABC \sim \Delta ADB, \quad AB^2 = AC \cdot AD$$


محیطی (مثلث قائم‌الزاویه)

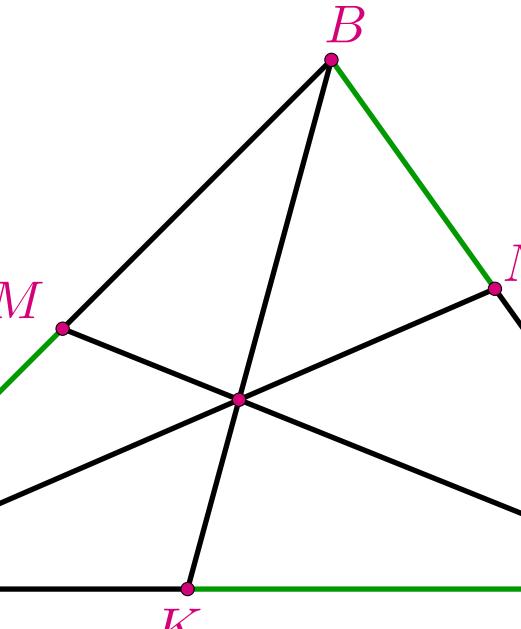
$\triangle ABC$ قائم‌الزاویه
قطر است.
 $R = OB = OC = OA$


قضیه فیثاغورس

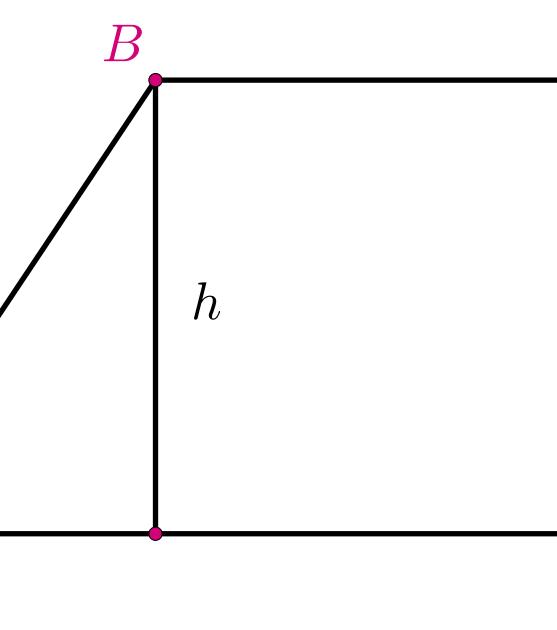
$$\Delta ABC \text{ قائم‌الزاویه} \iff a^2 + b^2 = c^2$$


قضیه سوا (Ceva)

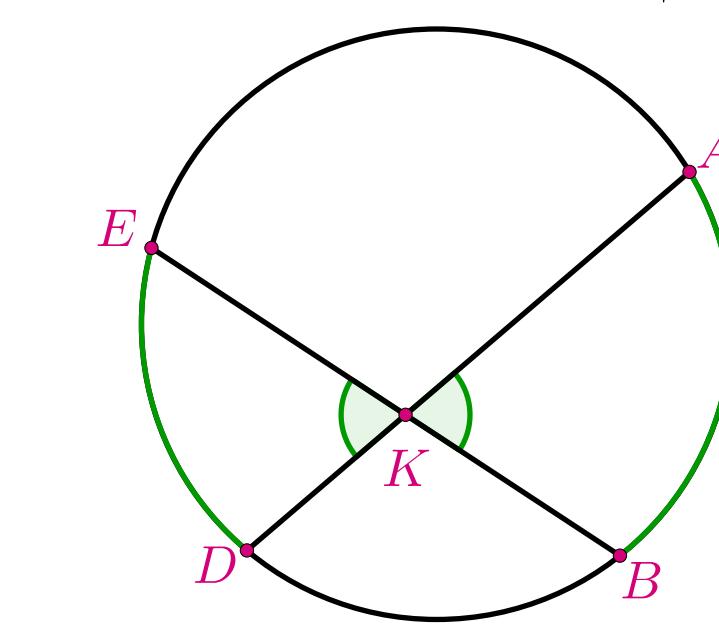
$$\frac{AM}{MB} \cdot \frac{BN}{NC} \cdot \frac{CK}{KA} = 1$$


مساحت ذوزنقه

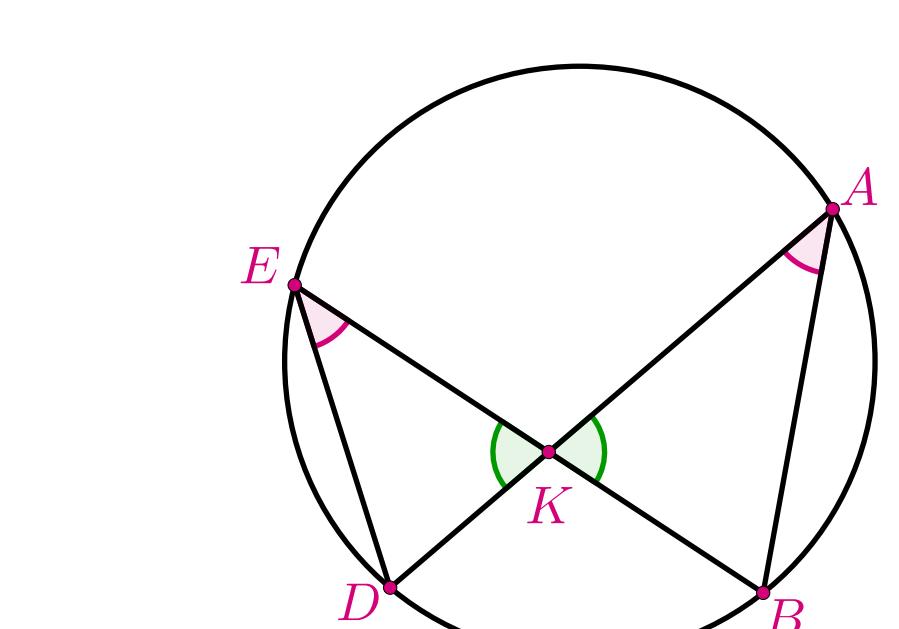
$$S_{ABCD} = \frac{AD + BC}{2} \cdot h$$


زاویه بین دو وتر

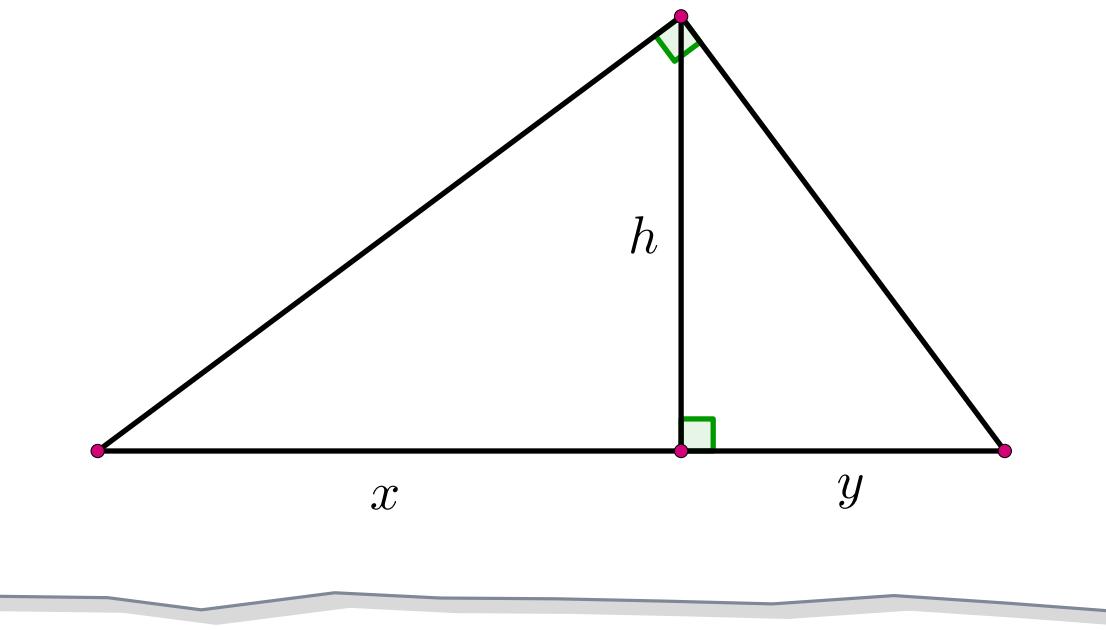
$$\angle AKB = \angle EKD = \frac{\angle AB + \angle ED}{2}$$


وترهای متقارن

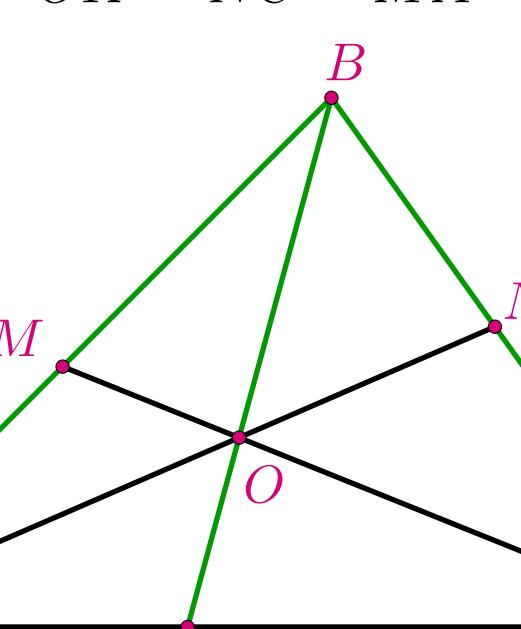
$$\Delta AKB \sim \Delta EKD, \quad AK \cdot KD = BK \cdot KE$$


ارتفاع در مثلث قائم‌الزاویه

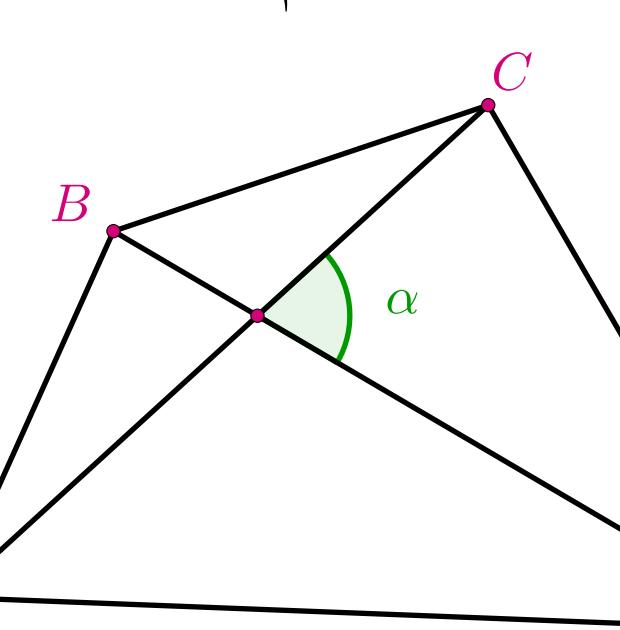
$$h^2 = x \cdot y$$


قضیه وان اوبل

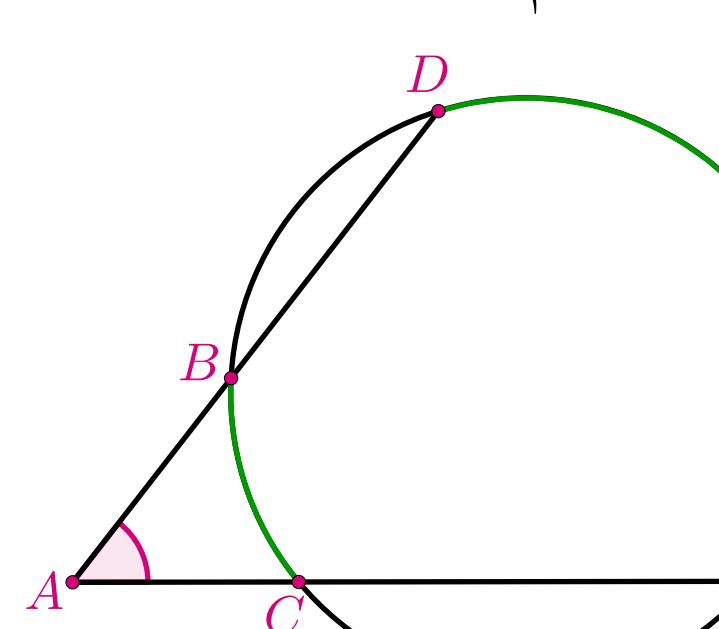
$$\frac{BO}{OK} = \frac{BN}{NC} + \frac{BM}{MA}$$


مساحت چهارضلعی

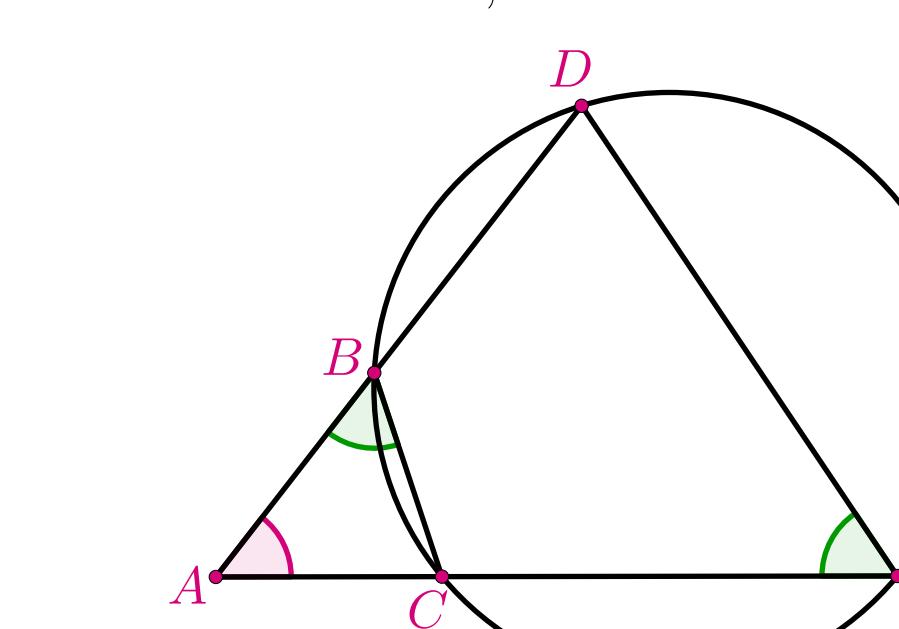
$$S_{ABCD} = \frac{1}{2} \cdot AC \cdot BD \cdot \sin \alpha$$


زاویه بین دو قاطع

$$\angle BAC = \frac{\angle DE - \angle BC}{2}$$


رابطه دو قاطع

$$\Delta ABC \sim \Delta ADE, \quad AB \cdot AD = AC \cdot AE$$


چهارضلعی محیطی

$\iff AB + CD = BC + AD$ محیطی $ABCD$

