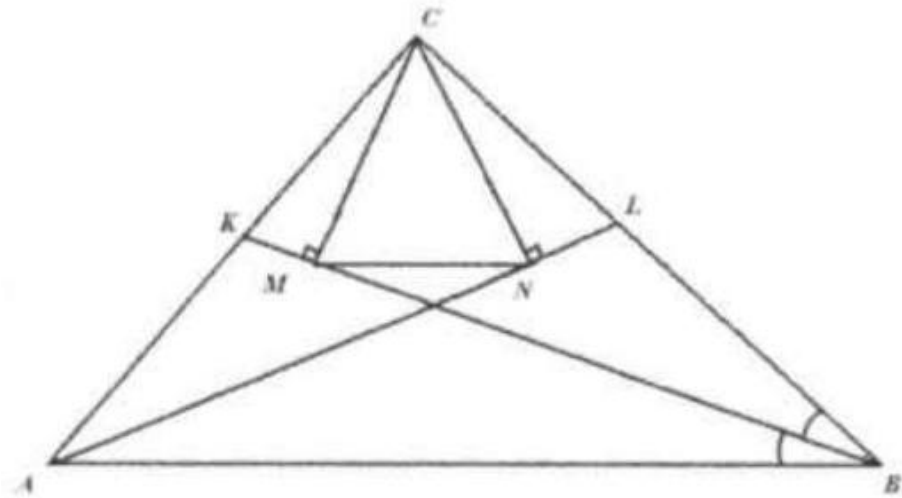


Problem 7

Problem

In triangle ABC , the angle bisector of angle A intersects BC at point L , and the angle bisector of angle B intersects AC at point K . Let M and N be the feet of the perpendiculars from C to BK and AL , respectively. Show that

$$MN = \frac{1}{2}(BC + AC - AB).$$


Solution

Extend MN such that it intersects lines AC and BC at point O and Q , respectively. Extend CM to meet AB at, say, S . then triangle BCM and triangle BSM are congruent. Hence $BS = BC$. Similarly, extend CN to meet AB at, say, R , and triangle ACN and triangle ARN are congruent. Hence $AR = AC$. So $CM = MS$, and $CN = NR$. So MN is the midline of triangle CSR .

