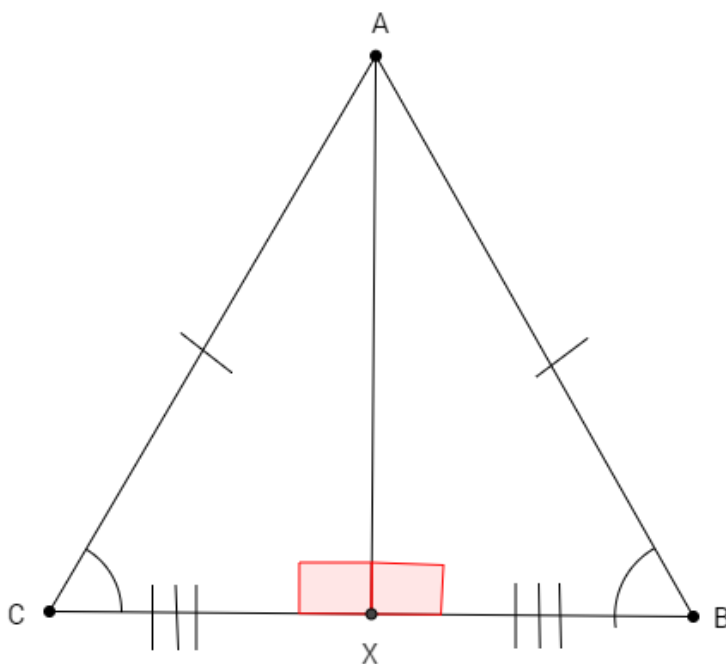# The Altitude and Median of an Isosceles

Harmony Van Nevele

April 27, 2015

Theorem H. Let ABC be an isosceles triangle and X be a point on side BC. If a segment AX makes two right angles AXC and AXB, then sides BX and CX will be congruent.

Proof. Let ABC be an isosceles triangle and segment AX make two right angles AXC and AXB. Since ABC is an isosceles triangle, we know that sides AC and AB are congruent and angles ACB and ABC are congruent by Euclid's book I, proposition 5. Since these sides and angles are congruent and angles AXC and AXB are congruent because they're both right angles, the triangles must be congruent by Euclid's book I, proposition 26. Since triangles ACX and ABX are congruent triangles, then sides CX and BX must also be congruent.