Bogdan Alex Georgescu
Iron Curtain Mathematics : Grade 6: Geometry : Congruent and Similar Triangles
June 24, 2023

P1. Height And Median In An Isosceles Triangle

Question 1. Consider isosceles triangle $\triangle ABC$ ($AB \cong AC$) and M the middle of BC as shown in Figure 1. Prove that $AM \perp BC$.

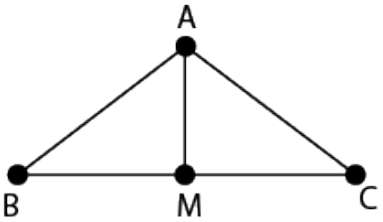

FIGURE 1. Isosceles triangle and median.

Proof:

The symbol $\cong$ means congruence that is same shape (measures) but not equality. Equality means the same sets of points.

$AM \perp BC$ means the measure of angle $\angle AMB$ is equal to the measure of angle $\angle AMC$ is equal to $90°$.

The proof is based on the primary observation that triangles $\triangle BAM$ and $\triangle CAM$ are congruent.

We have $AB \cong AC$ and $BM \cong MC$. The case of congruence observed is side-side-side.

From the congruence of the triangles mentioned before we observe the congruence of the angles $\angle BMA$ and $\angle AMC$.

The sum of (the measures of) these two congruent angles is $180°$. We deduce each of them has a measure of $90°$.

We conclude: $AM \perp BC$.

APT. 805 80 POINT MCKAY CR NW, CALGARY, ALBERTA, CANADA, T3B 4W4