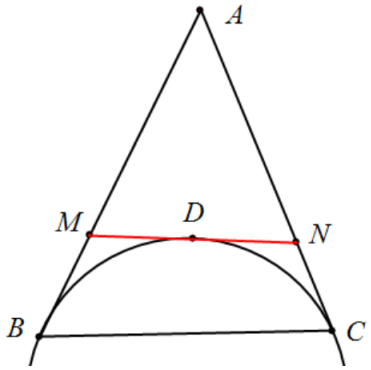
**Example 1 35 : As shown in the figure,** in $\triangle ABC$, $D$ is the incenter, and the tangent line of the circumscribed circle of $\triangle BCD$ *passing through* $D$ *intersects* $AB$ at $M$ and $AC$ at $N$. Prove: $AM = AN$.




$$\frac{B-A}{M-N}\frac{B-D}{B-C}\frac{C-B}{C-D}\frac{C-D}{C-A}\frac{M-N}{D-C}\frac{N-M}{C-A}\frac{B-A}{B-D}\frac{D-B}{N-M}\frac{C-B}{C-D}\frac{B-D}{B-C}=1$$