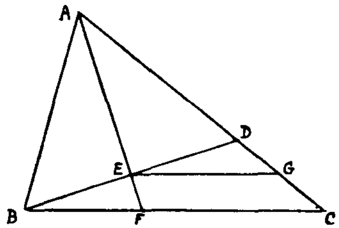
Geometrical Proof of $\frac{\tan \frac{1}{2}(B-C)}{\tan \frac{1}{2}(B+C)} = \frac{b-c}{b+c}$.



Consider triangle ABC.

From AC cut off $AD = AB$; join BD; draw AE perpendicular to BD and produce to meet BC in F; draw EG parallel to BC. Then, by Geometry, E and G are mid-points of BD and DC respectively; $A\widehat{B}D = A\widehat{D}B = \frac{1}{2}(B+C)$ since $\widehat{A}$ common to triangles ABD and ABC; $E\widehat{B}F = B - \frac{1}{2}(B+C) = \frac{1}{2}(B-C)$.

$$\frac{\tan \frac{1}{2}(B-C)}{\tan \frac{1}{2}(B+C)} = \frac{EF/BE}{EA/BE} = \frac{EF}{EA} = \frac{GC}{GA} = \frac{\frac{1}{2}(b-c)}{\frac{1}{2}(b+c)} = \frac{b-c}{b+c}.$$

ALEX. D. RUSSELL.

Angles between the Medians and Sides of a Triangle.

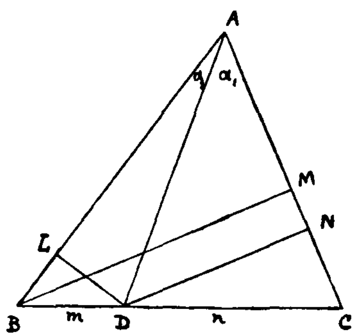


Fig. 1.

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