90. [In any spherical triangle ABC produce BC to D so that CD is a quadrant]

Author(s): W. E. Hartley

Source: *The Mathematical Gazette*, Vol. 1, No. 24 (Dec., 1900), p. 413

Published by: [The Mathematical Association](#)

Stable URL: <http://www.jstor.org/stable/3604474>

Accessed: 14-03-2016 14:11 UTC

Your use of the JSTOR archive indicates your acceptance of the Terms & Conditions of Use, available at <http://www.jstor.org/page/info/about/policies/terms.jsp>

JSTOR is a not-for-profit service that helps scholars, researchers, and students discover, use, and build upon a wide range of content in a trusted digital archive. We use information technology and tools to increase productivity and facilitate new forms of scholarship. For more information about JSTOR, please contact support@jstor.org.

The Mathematical Association is collaborating with JSTOR to digitize, preserve and extend access to *The Mathematical Gazette*

<http://www.jstor.org>

Now $AN > =$ or $< AM$ according as $\hat{C} > =$ or $< \hat{B}$,

i.e., as
$$\frac{\hat{A}}{2} + \frac{\hat{C}}{2} > = < \frac{\hat{A}}{2} + \frac{\hat{B}}{2},$$

or as $\text{perp. from } A \text{ on } CN > = < \text{perp. from } A \text{ on } BM,$

or as $AC \cdot AN > = < AB \cdot AM.$

Hence $AN = AM$ and $\hat{C} = \hat{B}$. R. F. DAVIS.

90. [K. 20. F.] In any spherical triangle ABC produce BC to D so that CD is a quadrant. Then from the fundamental formula

$$-\cos c \sin a + \sin c \cos a \cos B = \cos AD = -\sin b \cos C,$$

or, rearranging and dividing by $\sin C$,

$$\sin a \cot c = \sin B \cot C + \cos a \cos B. \quad \text{W. E. HARTLEY.}$$

91. [L¹. 7. d.] *If one focus of a conic inscribed in a triangle lies on the line joining the circum- and the ortho-centres of the triangle, the locus of the other focus will be an equilateral hyperbola circumscribing the triangle and passing through its circum-centre.*

Let $la + m\beta + n\gamma = 0$

be the straight line, then since

$$\cos A : \cos B : \cos C,$$

$$\sec A : \sec B : \sec C$$

are the coordinates of the points through which it passes, we have

$$l \cos A + m \cos B + n \cos C = 0, \dots\dots\dots(1)$$

$$l \sec A + m \sec B + n \sec C = 0, \dots\dots\dots(2)$$

but if $\alpha_1 : \beta_1 : \gamma_1$ is one focus,

$$\frac{1}{\alpha_1} : \frac{1}{\beta_1} : \frac{1}{\gamma_1}$$

denotes the coordinates of the other, therefore the locus of the other focus is

$$\frac{l}{\alpha} + \frac{m}{\beta} + \frac{n}{\gamma} = 0. \dots\dots\dots(3)$$

The condition (1) makes (3) an equilateral hyperbola, and (2) is the condition that it should pass through the circum-centre. J. M. DYER.

PROBLEMS.

[Much time and trouble will be saved the Editor if (even tentative) solutions are sent with problems by Proposers.]

390. [K. 13. a.] If $A_1, \dots A_6$ be any six points ranged in this order on the circumference of a circle, and O any point in space,

$$\begin{aligned} OA_1^2/\Pi(A_1A_4) + OA_3^2/\Pi(A_3A_5) + OA_5^2/\Pi(A_5A_4) \\ = OA_2^2/\Pi(A_2A_4) + OA_4^2/\Pi(A_4A_5) + OA_6^2/\Pi(A_6A_4), \end{aligned}$$

where $\Pi(A_1A_4) = A_1A_2 \cdot A_1A_3 \cdot A_1A_4 \cdot A_1A_5 \cdot A_1A_6$, etc. SIR ROBERT BALL