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## SOME INTERESTING PROOFS FROM "YUKTI-BHASHA"

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"Yukti-Bhasha" is the work of an ancient Kerala mathematician, and is conjectured (from internal evidence) to have been written in 1639 A.D. Recently a valuable edition of "Yukti-Bhasha" has been published by the Mangalodayam Press, Trichur. In this paper references are made to this edition. All the theorems, constructions and proofs given here are taken directly from *Yukti-Bhasha* and presented in modern notation with modifications wherever necessary. The proof given for lemma 3 is a modified form of that given in *Yukti-Bhasha*.

1. *Theorem of Pythagoras* (Ref. Chap. VI, page 72).—Let ABC be a triangle in which the angle A is a right angle. Suppose  $AB > AC$ .

*Construction*.—On the sides AB and AC describe squares ABDE and ACFG the former on the same side as the hypotenuse and the latter on the side away from it.

Step off  $GAH = AB$ , and on AE produced locate K such that  $EK = AC$ . Join FH, HD, DK and KF.

*Proof*.—Now each of the triangles GHF, HBD, DEK and KCF is right-angled, and has one side of length AB and another of length AC.

$\therefore$  All the triangles are congruent to ABC.

$\therefore HF = HD = DK = KF = BC$ .

In the triangle GHF

$$\angle GHF + \angle GFH = 90^\circ.$$

$$\text{But } \angle GFH = \angle BHD$$

$$\therefore \angle FHD = 90^\circ.$$

Hence figure FHDK is the square on BC.