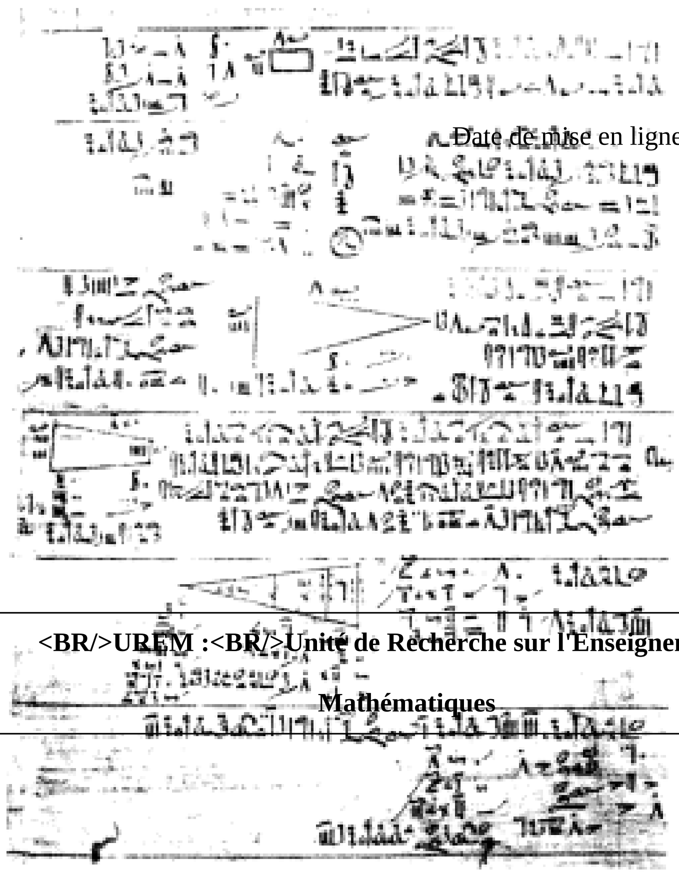
Le théorème de Pythagore et Alexandre Wajnberg

- Equipes de travail - Histoire des mathématiques -



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comporte une longue série de démonstrations du théorème de Pythagore dont la n° 79 est due à Alexandre Wajnberg

« Proof #79

There are several proofs on this page that make use of the Intersecting Chords theorem, notably proofs ##59, 60, and 61, where the circle to whose chords the theorem applied had the radius equal to the short leg of ”ABC, the long leg and the altitude from the right angle, respectively. Loomis' book lists these among its collection of algebraic proofs along with several others that derive the Pythagorean theorem by means of the Intersecting Chords theorem applied to chords in a fanciful variety of circles added to ”ABC. **Alexandre Wajnberg from Unité de Recherches sur l'Enseignement des Mathématiques, Université Libre de Bruxelles** came up with a variant that appears to fill an omission in this series of proofs. The construction also looks simpler and more natural than any listed by Loomis. What a surprise !

Consider the circumcircle of ”ABC whose radius equals a half hypotenuse ($r = c/2$).

In the diagram, DF is the diameter perpendicular to side BC and serves as its perpendicular bisector. E and H are the midpoints of BC and AC, respectively, making EO = CH. From the Intersecting Chords theorem,

$CE \times EB = DE \times EF$, which, in terms of side length a, b, c, appears as

$(a/2)^2 = (c/2 - b/2)(c/2 + b/2)$. This simplifies to the required $a^2 = c^2 - b^2$. »

Consulter le lien

http://www.cut-the-knot.org/pythagoras/index.shtml