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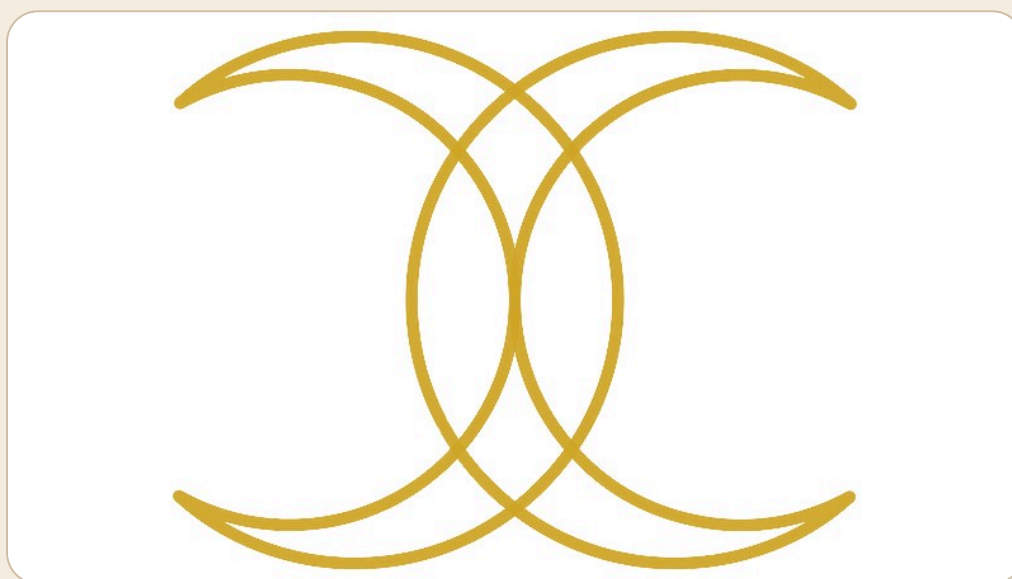
PROBLEM

Muhammad's Signature: A Geometrical Puzzle Between Science and Faith

Through geometry the soul touches the divine. Omar Khayyam

Mansur Gilmullin · 19.03.2025 · EN

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The ornament known as Muhammad's Signature · [Source](#)

Through geometry the soul touches the divine.

— Omar Khayyam

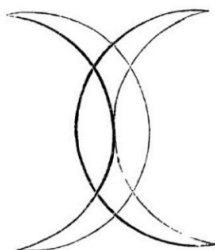
There are no accidental lines in Islamic art. Every curve and every angle embodies faith in the harmony of the universe created by Allah.

Among thousands of geometrical ornaments, one stands out: the design known as “Muhammad’s Signature.”

The legend of the Moon's two horns

According to a legend, instead of signing his name Muhammad drew, in a single stroke, the sign shown in the illustration: two intersecting crescents.

Я слышалъ, что Магометъ чертилъ съ одного почерка
остріемъ палаша свою подпись, представляющую два скре-
щенныхъ полумѣсяца, какъ это показываетъ фиг. 5. Въ са-



Фиг. 5.

момъ дѣлѣ, такъ какъ на этой фигурѣ встрѣчаются лишь
точки, въ которыхъ пересѣкается четное число линій, то чер-
ченіе ея съ одного почерка не представляетъ никакихъ затруд-
неній.

A problem from Édouard Lucas's *Mathematical Recreations* · [Source](#)

This symbol became part of Islamic culture and also a subject of debate among historians, astrologers and art historians.

Some researchers believe that the sign may have been a stylized version of the Arabic letter *mīm*, representing Muhammad's name.

Mathematicians turned this legend into a problem: “Draw this figure in a single stroke without retracing any lines.”

Can you explain why Muhammad could draw it in a single stroke of the pen? The answer appears below.

Try drawing the figure yourself.

As you know, problems of this kind require the figure to be drawn in one continuous stroke, without lifting the pencil from the paper or doubling any line. In other words, once a line has been drawn, you cannot go over it again.

Constructing this symbol calls for a knowledge of geometry.

Notes

This problem appears in several collections of old and recreational problems, including:

1. Ignatyev, E. I. *In the Kingdom of Ingenuity*. Moscow: Nauka, 1978. 192 pp. [In Russian.]
2. Lucas, Édouard. *Mathematical Recreations*. St Petersburg: F. Pavlenkov, 1883. 204 pp. [Russian edition.]

Answer

The solution rests on the principles of graph theory. In this drawing every vertex has even degree, so it is possible to draw the figure in a single stroke without retracing any line.